

 THE RADIO
LEARNING
PROJECT



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**RADIO LEARNING PROJECT
ANNUAL REPORT - 1988**

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THE RADIO LEARNING PROJECT

ANNUAL REPORT FOR 1988

INTRODUCTION

The purpose of the Radio Learning Project (RLP) is to disseminate information about interactive radio instruction and to encourage and support the development of new interactive radio projects. This five-year project, begun in October, 1985, is funded by the Agency for International Development (A.I.D.), Bureau for Science and Technology, Office of Education, through a contract to a consortium comprised of the Education Development Center (EDC) as the prime contractor, the Academy for Educational Development (AED) and Friend Dialogues of North Carolina, Inc.

The Radio Learning Project aims to improve the learning of basic primary school skills by using interactive radio instruction (IRI). The project now builds upon fifteen years of research and development resulting in effective, low cost, radio-based curricula for developing nations. Curricula are now available for primary school mathematics, health, reading and writing in Spanish, and English as a second language. A school science curriculum for grades 4-6 is being developed by the Radio Science Project under an A.I.D. contract with EDC.

During its third year of activity, the RLP successfully developed new programs and maintained previous projects in Honduras, Bolivia, Ecuador and Costa Rica. In addition, non-RLP interactive radio activities continue in Thailand, the Dominican Republic, Lesotho, and Papua New Guinea.

The RLP's productivity during 1988 attests to the increased recognition that IRI can help meet educational needs in developing countries; it also shows the staff's increased expertise in both adapting and implementing IRI in new cultural situations. These capabilities will be strengthened further as the RLP adds radio-based teacher training to existing lessons and also defines its marketing strategy for the final years of the project.

SUMMARY OF IRI PROJECTS

Early in 1988 AVANCE, a private agency administering the RLP's Honduras project, introduced a mental arithmetic series to 70,000 first-grade children in six of the country's eighteen districts. The summative evaluation, which compared three groups, demonstrated the strong impact of both IRI and new textbooks. The groups were traditional classes, classes using new textbooks, and classes with both new texts and radio instruction. Tests showed that students learned substantially more with new books, but that these gains were almost doubled when IRI was used in tandem with the texts. These lessons will be broadcast to all 200,000 first-grade children in 1989. The Grade 2 lessons will be developed in 1989 and Grade 3 lessons in 1990.

Honduras was the first site to apply social marketing to interactive radio; the IRI materials were sold commercially rather than provided through the public education system. This approach was chosen in order to recuperate costs and, thus, to help maintain the radio system in schools after A.I.D. funding ends.

Following the development and implementation of the mental math series, AVANCE adapted the Kenyan English as a second language lessons for use in bilingual schools in Honduras. AVANCE plans to broadcast these lessons in late 1989 or early 1990. In addition, cassettes of these lessons will be tested in private schools in Tegucigalpa. The design of a new Spanish reading course for primary students will begin in 1989.

In mid-1988, the Ministry of Education in Costa Rica signed an agreement with AVANCE to purchase the mental arithmetic Grade 1 lessons and printed materials. AVANCE also agreed to provide ten weeks of staff technical assistance to CENADI (the National Teaching Center), the organization administering the pilot. Of particular note is that Costa Rica used the original Honduras tapes with only minor changes. These changes were completed in record time at low cost, and resulted in a very successful pilot study. The speed of adaptation and also the effectiveness of the activity testify to AVANCE's growing expertise in developing and promoting IRI lessons.

Bolivia also introduced an IRI math series in 1988. Fé y Alegría, a Catholic organization that administers the project, adapted the Grade 2 Nicaraguan math series for use in Bolivia and re-recorded all the lessons. These lessons were broadcast to 9,000 students in rural and urban schools. Test results for Grade 2 showed that children's math scores improved significantly, whether or not they were native speakers of Spanish, the language of radio instruction. Fé y Alegría plans to adapt Grades 3 and 4 lessons and to then develop a new math series for Grade 5.

Based on the success of the IRI math series, USAID/Bolivia and Fé y Alegría decided to develop new lessons on health issues. This series of approximately ten lessons will be broadcast to Grades 4 and 5 in 1989 and is designed to reduce child mortality rates by focusing on diarrheal diseases. Since the audience (10-13 year olds) includes those who are often primary caretakers for infants, it is hoped that the lessons will have an impact on the very high infant death rates. The evaluation will focus on the learning gains of the children.

In addition to its successful adaptation and implementation of the math lessons, and its completely new health curriculum, the RLP staff in Bolivia was able to share their experience by providing technical assistance to representatives from Ecuador where a similar math series is being introduced.

In 1988 Ecuador ran a pilot project, which showed impressive learning gains when IRI was used in multigrade classrooms. Between August and December, forty lessons were

broadcast to second-grade classes in 21 schools.¹ Besides proving the effectiveness of the methods, the pilot showed that CRECERA, a semi-autonomous agency within the Ministry of Education, is able to manage the project competently. Based on the pilot, USAID/Ecuador plans to develop a full IRI project to begin in 1990.

In Lesotho, a successful pilot project in 1987 led to use of IRI English lessons nationally for Standard 1 in 1988. The country's *English in Action* series is adapted from the Kenyan Radio Language Arts Project (RLAP). Funding for the adaptation was undertaken by A.I.D.'s Basic and Non-Formal Education Systems (BANFES) project, administered by the Academy for Educational Development, and carried out by Lesotho's Ministry of Education.

The Radio Science Project in Papua New Guinea is funded by A.I.D. separately from the RLP under a contract with the Education Development Center. Friend Dialogues is the subcontractor. The RSP aims to develop a high quality, cost-effective science program of IRI for upper primary grades in rural schools. The radio programs follow the PNG science syllabus, but also provide material on health, agriculture, and community life. Each of the semi-weekly lessons includes a twenty-minute broadcast and a ten-minute post-broadcast activity period.

During 1988 science lessons on cassettes were used by Grade 4 in fifteen schools. The summative evaluation of the Grade 4 lessons will be completed in 1989. Grade 5 lessons will be developed in 1989 and the Grade 6 lessons in 1990. Plans for 1989 and 1990 include significant attention to teacher training through radio and/or cassette lessons designed to help teachers use the radio lessons better in their classes, and become more competent science teachers themselves.

In the Dominican Republic, the Ministry of Education continues to broadcast the RADECO math and language series to 80 communities where there are no formal schools.

Finally, IRI math lessons are continuing to be broadcast in Thailand.

PROMOTIONAL ACTIVITIES

Newsletter

A report on the Radio Learning Project was released in April, 1988. The newsletter contains articles on IRI's role in improving basic education in different parts of the world, and provides brief reports about IRI in Honduras, Bolivia, the Dominican Republic, Ecuador, Costa Rica, Papua New Guinea, Thailand and Lesotho.

¹ Twenty-one schools were selected to participate in the project. An additional nine schools, which were originally part of a control group, listened to the broadcasts unofficially and were merged with the others for a final total of thirty participating schools.

Technical Briefs

New technical briefs and notes were prepared for distribution to potential IRI users worldwide. These provide information on specific IRI programs and also on selected issues such as student achievement in IRI classes and the role of classroom teachers in this kind of instruction. A full list of these publications is in Appendix IV.

Conference Presentations

At the annual Comparative and International Education Society (CIES) meetings in Atlanta, Georgia, Thomas Tilson, Project Director and Allan Kulakow, former AED Project Coordinator, gave a presentation on IRI, "Policy Issues Affecting Implementation of Educational Innovations: Case Studies with Interactive Radio Instruction."

Thomas Tilson also gave a presentation on IRI to the World Bank's Economic Development Institute seminar in April 1988. Then in September he gave a presentation to the World Bank's Africa Region Technical Department staff. Other presentations and publications may be found in Appendix III.

Second Latin American Conference on Interactive Radio

Sixty-five delegates from eleven Latin American, African, and Asian countries and the United States attended the conference in Tela, Honduras from November 14-18, 1988. Most delegates represented nations where IRI is already in use or where its adoption is likely. Workshops were held on the use of IRI in basic education and teacher training. Topics included project design, adaptation, financing, evaluation, information dissemination, and potential use in non-formal education. Co-hosted by AVANCE, the Honduran Ministry of Education, the Radio Learning Project, and A.I.D.'s Bureau for Science and Technology, Office of Education, the conference provided delegates with opportunities for technical exchange at a time when the use of IRI is beginning to expand rapidly. A copy of the conference agenda and final report are included in Appendix II.

Other Country Contacts

Botswana

The RLP maintained contact with Botswana, initiated in 1987 through the representative of the Improving the Efficiency of Educational Systems (IEES) project and explored possible collaboration between Botswana, Lesotho and Swaziland.

Cameroon

The RLP continued its informal contact with the Mission and the Director General of Television and Radio, Mr. Florent Etogo Eily. He is interested in using television for educational purposes and in possible applications of the IRI methodology to educational television.

Egypt

The RLP continued to pursue two areas of possible use of radio in Egypt: teaching English as a second language, especially to junior high school students who are just beginning English; and teaching primary school mathematics as part of the basic education proposal. The Mission has, however, continued to give higher priority to teaching English for higher education and for employment purposes.

Liberia

The RLP followed up on earlier contacts with USAID and the Liberian MOE officials, who in 1986 and 1987 had expressed interest in using radio to support teacher training and to complement the Improving the Efficiency of Learning (IEL) curriculum being introduced into Liberian schools. The RLP will seek to collaborate with the MOE once the new Primary Education Project is underway.

Malawi

Tom Tilson visited Malawi in October 1988 as part of a World Bank mission to design an educational sector credit. He gave special attention to incorporating IRI into the plans. Following his visit Robert Manondo, Deputy Principal of the Malawi College of Distance Education, participated in the IRI conference held in Tela, Honduras, and stayed a few days in Tegucigalpa to visit with AVANCE.

The Pacific Islands

Interest in distance education by radio appears to be growing in this region. The RLP has been in touch with education officials from ten Pacific nations during 1988. Three of these countries are exploring the possibilities of radio education for primary schools. One nation, Vanuatu, has already committed itself to develop this type of project. Two others, Kiribati and the Solomon Islands, have authorized feasibility studies of radio education and are seeking financial support.

Most educational funding in this region has traditionally been provided by the Australian International Development Assistance Bureau (AIDAB) and is therefore obligated to use Australian goods and services. However, the RLP has learned from AIDAB that sub-contracting is open to foreign firms. During 1989 we will continue to pursue the possibility of sub-contracting to Australian distance education providers in order to work on Pacific IRI programs.

Pakistan

The RLP maintained contact with MOE, USAID, and World Bank officials working on education projects in Pakistan. Materials on IRI were sent to the Mission as it prepared the Project Implementation Document (PID) for a basic education project. This was a follow-up to earlier contacts including a) a background paper prepared by the RLP on the possible use of IRI in Pakistan and b) a site visit to Islamabad by Tom Tilson in 1987.

The RLP received a proposal for an IRI upper primary school social studies project from the MOE Academy of Planning and Management. The USAID mission suggested that the RLP delay consideration of the project until 1989.

Somalia

The RLP contacted the mission regarding a proposal submitted in 1987 for adapting the original Radio Mathematics lessons for use in Somalia, giving special attention to the vast majority of children who do not attend school. No action was taken by the mission.

Swaziland

The RLP and Swaziland's Ministry of Education held talks on the possible replication of the Lesotho *English in Action* series (adapted from the Kenyan RLAP project) for teaching English in primary schools. Zodwa Ginindza, an official of the Swaziland Ministry of Education at present studying in the USA, attended the Second Latin American Conference on Interactive Radio held in Tela, Honduras in November 1988, and subsequently held talks with the RLP on the possibility of implementing IRI programs in Swaziland's primary schools.

Collaboration with Other Institutions

URTNA

The URTNA (Union of National Radio and Television Organizations in Africa) Programme Exchange Center in Nairobi fosters the development and exchange of radio and television programs in English, French, and Arabic-language. The RLP has held several discussions with URTNA on collaboration between the Center and the RLP. RLP has offered limited financial assistance to co-sponsor a workshop on educational radio in Africa with URTNA, but no plans have been made to date for such a workshop. URTNA has also helped with the dissemination of RLP materials to interested African countries.

UNICEF

The RLP held talks with UNICEF on possible collaboration with the U.N. agency's work. An article on IRI was published in the agency's newspaper Action for Children.

SITE ACTIVITIES

Bolivia

Mathematics

In 1987 Fé y Alegría, with funds from USAID/Bolivia and the RLP, conducted a successful pilot study to assess the efficiency of using IRI to improve basic primary math education in Bolivia. The pilot demonstrated that:

- o Bolivian children could learn math effectively by radio;
- o lessons developed in Nicaragua could be adapted appropriately for Bolivians;
- o teachers could use the lessons with minimal training, and
- o Fé y Alegría would be able to implement the project administratively and technically.

Fé y Alegría is one of several non-government organizations that administer public schools for the Ministry of Education. Although these are good schools by Bolivian standards, concerned parties agreed that IRI instruction in basic mathematics would enhance the general quality of instruction.

During 1988 a large-scale project began with the adaptation of the Grade 2 lessons from the Radio Mathematics Project in Nicaragua. Programs were broadcast to 243 urban and rural second-grade classrooms with about 9,000 children. More than 250 Bolivian teachers and school directors were trained in IRI methods. Throughout the year, lessons were revised based on field observations. Analysis of final test results showed that second graders using the radio lessons had learned substantially more than those taught conventionally.

Table 1 Bolivia - Grade 2: Comparison of Learning Gains

Control Group Mean Score	Radio Group Mean Score	Effect Size
47.0%	66.3%	.91

The final evaluation also showed that bilingual Indian children were not held back by the radio math lessons in Spanish. Bilingual Indian and native Spanish-speaking children in both the control and radio groups improved significantly. (See Table 2, pg. 8.)

The project apparently had a more varied audience than it had originally targeted. Second graders were not the only beneficiaries of the lessons. According to anecdotal information from parents and teachers, the programs were also used by out-of-school youth, uneducated or undereducated adults and primary school teachers who had not participated in the project's teacher training program.

Plans went ahead for the production of Grade 3 math lessons. The production and evaluation teams were given a week of intensive training on third grade math curriculum, including multiplication, division, fractions and decimals.

Table 2 Bollvia - Grade 2: Mean Mathematics Test
Scores by Language Group

	Control	Radio
Spanish	52.6%	70.4%
Bilingual Indian	38.0%	56.6%

The Bolivian Radio Education staff was able to share expertise with another fledgling RLP math project in Ecuador. Three members of the Ecuadorian IRI team visited the RLP in Bolivia for on-site training in lesson adaptation, program planning and administration, teacher training, formative evaluation, test development, summative evaluation, and community organization. This visit in August, 1988, helped prepare the Ecuadorians for their own five-month pilot study.

Originally, the Bolivian project had planned to develop the math series only through Grade 4 before developing a Grade 1 language series. Because of the widespread grassroots popularity of the lessons, the project is now planning to complete a radio math series for Grades 2-5. To do this, the staff will rely more on its own skills than on the original Nicaraguan scripts. Grade 4 will be a major revision of the Nicaraguan version and Grade 5 will be a completely new curriculum. The math programs will also move into three additional Bolivian departments in 1989, so they will be broadcast in six of the nine departments. The capacity of the Fé y Alegría team to carry out this expanded work is a major testimonial to the institution building process made possible by the RLP.

Radio Health

On the recommendation of the USAID mission in Bolivia, the Radio Education Project is developing IRI health education programs as part of a strategy to reduce child mortality. Each radio health program will be 20 minutes long and will be broadcast weekly for school children in Grades 4 or 5. The first series of ten broadcasts and complementary post-broadcast activities will give special emphasis to the child survival topics of diarrhea and ORT. Additional series might be developed on other health and nutrition topics.

A health and nutrition oriented educational program presents special challenges because diet and eating habits are influenced by sociocultural beliefs and attitudes. Knowledge and respect for such beliefs and the ability to integrate them into acceptable health messages requires great sensitivity from program developers. To meet the needs of teaching a health curriculum in Bolivia, extensive field research was done in the areas of

health and nutrition before program plans were developed. To ensure the design of an appropriate health curriculum for primary schools, ethnographic research was carried out in the following areas: cultural beliefs and perceptions of health issues, family health practices, attitudes towards written and audio materials, children's roles in health and nutrition, and traditional stories and legends related to health and nutrition. This information is being incorporated into the IRI lessons. Activities and practices that children have control over (such as washing their hands) will be emphasized in the curriculum. Complementary IRI program materials will include take-home exercises designed to involve family participation, and teacher's guides to provide teachers with practical hands-on activities to strengthen children's understanding of health concepts. Short in-service training sessions will prepare teachers to manage radio classes and carry out post-broadcast activities with students.

Honduras

The Radio Learning Project is working with AVANCE (the Association for Socioeconomic Advancement and Development) to develop interactive radio instruction in Honduras. AVANCE is a USAID/Honduras-supported private agency with a broad mandate for the use of mass media in education and social development.

During 1988 AVANCE continued the development and implementation of its mental arithmetic courses for Grade 1. In addition, the organization began to adapt the Kenyan RLAP lessons in English as a second language for use in bilingual schools. In 1989 the project plans to develop the Grade 2 math lessons and to begin a Spanish reading course for grades 1-3.

The Mental Arithmetic Program

The AVANCE mental math series *La Familia de los Números* is unique because it focuses on mental computation skills. It aims to help students master mental processes which are the basis for all work in mathematics. The course stresses cognitive skills including algorithms, proofs, problem solving, estimation, and memorization. Lessons have been designed to complement rather than replace new textbooks, introduced in Honduras in 1987. Because the program requires no expensive support material and only minimal teacher training, it could be adapted easily and inexpensively for use anywhere.

The first implementation phase for the Grade 1 math lessons began in April 1988 reaching 3,000 classrooms and 70,000 children in six of the country's eighteen districts. More than 2,900 teachers purchased specially packaged materials to accompany the lessons. At end of the school year, students were evaluated and mean test scores were compiled for three groups of first graders:

- o a "traditional" group of children who received instruction without textbooks or radio lessons,
- o a "textbook" group which used the new books,

- o a "radio" group of children which had used both textbooks and the radio lessons.

The results, as reported by Jamesine Friend of Friend Dialogues, were extremely positive.

The traditional group was tested at the end of the 1987 school year, before either the textbooks or the radio lessons were available. The textbook and radio groups were tested at the end of the 1988 school year... The traditional group and the radio group are in the same region (Francisco Morazán) and are, in fact, two groups of children in exactly the same schools, tested one year apart... The children in the two groups come from the same communities, from the same socioeconomic conditions, have the same school facilities, often have the same teachers, etc. Because they are from the same educational environment, these two groups can be considered comparable.

The textbook group is from a region (El Paraiso) where the radio signals could not be received, so these children presumably could not have listened to the radio lessons. However, the comparability of the textbook group to the other two groups is not easily justified. They may have had different school facilities, different socioeconomic conditions and teachers with levels of expertise different from those of the other two groups.

Ordinarily the comparability of two groups is investigated by pretesting the children in the two groups to see if incoming skills are the same. However, because of the time schedule, it was not possible to pretest these groups...To compare the two school systems and the children who attend them, [scores in those schools were analyzed] after two years of traditional instruction [e.g. children were tested in math at the end of the second grade].

The small difference between the mean scores of the children of El Paraiso (52.5%) and those in Francisco Morazán (51.4%) after two years of traditional learning was not significant so a comparison of first-grade scores seems justified in the two regions. Results showed that the use of the new textbooks had a significant effect on scores, with an increase from 34.3% to 43.7%. The use of radio lessons further increased scores, to a mean of 51.9%. All of these differences are highly significant. (See Table 3, pg. 11.)

In addition to the final evaluation of first graders, a sample of teachers was interviewed to assess their views on the radio lessons. A summary of this Usage Study can be found in the Appendix I.

The success of this series has encouraged a market for other products of AVANCE. From its inception, the project was expected to develop secondary markets for optional educational materials among teachers and school children. This objective has already been met in part by sales of a songbook and cassettes developed from the popular musical soundtrack of the IRI lessons.

Table 3 Honduras - Grade 1: Comparison of First Grade Posttest Scores

	Traditional Instruction	Textbooks	Textbooks and Radio
Mean score	34.3%	43.7%	51.9%
Effect size compared with:			
Traditional		0.43	0.80
Textbooks			0.37

The Radio English Program

During 1988 plans progressed to adapt the Kenyan Radio Language Arts Program (RLAP) of English as a second language for use in bilingual primary schools. AVANCE has developed these lessons as a generic ESL series which can be used throughout Latin America. AVANCE plans to market them commercially throughout the region after they have been tested in Honduras.

Costa Rica

This year the Costa Rican Ministry of Public Education demonstrated that IRI lessons could be adapted to a new country very quickly and with very little technical assistance. To raise the quality of education the Ministry recently created a center to improve teacher training and instruction to children. Of particular concern were schools in more remote areas of the country, especially those with only one teacher. The new and innovative National Center for Teaching or CENADI (Centro Nacional de Didáctica) is adapting the new Honduran mental arithmetic lessons for use in rural regions of Costa Rica. The Ministry of Education views these IRI lessons as a way to strengthen math instruction and to support teachers in multigrade classrooms. Using technical assistance from AVANCE in Honduras, the Ministry and the RLP developed a two-phase plan to adapt the lessons to Costa Rica.

This project has been particularly cost effective. For the initial phase beginning in July, 1988, only the beginning and the end of each first-grade radio lesson were changed to refer to Costa Rica instead of Honduras. Except for these minimal changes, the lessons were used in their original form in twenty pilot schools. Based on the results from the pilot, Costa Ricans later rewrote certain lesson segments which were then sent back to AVANCE for re-recording by the original Honduran actors. The revised lessons will be broadcast to approximately 600 schools in 1989 and to an even larger number in 1990. A similar process is planned for adapting AVANCE's lessons for Grades 2 and 3 in 1989 and 1990.

The project was implemented very rapidly. After preliminary talks between RLP staff and the Costa Rican Ministry of Public Education, three Ministry staff members went to Honduras for a week to review operations there. As a result, they decided to introduce the lessons to Costa Rica. Subsequently, AVANCE staff provided both materials and technical assistance on site to CENADI, with financial help from the RLP. The broadcasts began only a few weeks after a letter of understanding was signed by the Costa Rican Ministry of Education and AVANCE. The high level of skill in CENADI simplified the technical transfer.

In 1989, in addition to implementing math programs for children, CENADI plans to develop a radio-based, in-service training program for teachers. UNED (National Distance Education University of Costa Rica) will offer IRI teacher training and give academic credit for these classes. Since teacher training can be particularly deficient in the area of mathematics, the new courses will contribute to CENADI's efforts to strengthen educational quality through improved teacher training. These lessons will be designed to help teachers use IRI lessons in the classroom and to improve their teaching of difficult math topics.

Ecuador

At the end of 1987 the chance of an IRI project being implemented in Ecuador in 1988 seemed promising. Two workshops had been held on radio education and a third one was planned on the use of IRI in multigrade classrooms. Following the third workshop, the Ministry of Education decided to sponsor a five-month pilot project during the last part of 1988. The result was one of the best and most productive pilots of IRI to date.

There was definitely a need for IRI. The country shared the problems typical of developing countries: too many unqualified teachers were teaching in overcrowded classrooms with scanty materials. Also, Ecuador had a large number of one room schools. Over 5,000 teachers instruct between 60,000 and 100,000 students in this type of situation. For this reason, the RLP's mandate to focus the pilot study on one-room schools was appropriate and welcomed.

Implementation of IRI benefited from an infrastructure which was superior to that of any other country hosting IRI projects. There were recording studios, radio stations willing to broadcast the lessons, and qualified professionals to work on educational radio. Studio and air time were free (although this might become an expense if IRI expanded).

The lessons were adapted from the original Nicaraguan math series. They were given a distinctly Ecuadorian flavor by the music; two dozen songs were specially written for the project by talented local musicians who essentially donated their time to the project.

There were no special promotional efforts to market the project. However, three staff members were interviewed for a half-hour each by local radio stations, for radio broadcasts. These interviews were on the air during the first week of school, so the timing may have helped promote the project.

Twenty-one classrooms in three provinces participated in the pilot activity from September-December, 1988. Five classrooms were designated an observation group; the remaining 16 one-room schools formed an experimental group and were not observed.

The Radio Learning Project encountered problems when it sought to evaluate the effect of the lessons. Although control schools were selected, many of the teachers in these schools were so interested in IRI that they tuned into the lessons; some even borrowed participating teacher's guides to photocopy them for their classes. When summative tests were given, it was impossible to separate schools into purely "radio" and "control" groups as initially planned. All of the students posttested (whether in the control or the radio group) had heard a number of the lessons.

To determine how much student improvement was due to radio lessons, the project researched the effect of varying numbers of lessons. To confirm the hypothesis that interactive radio instruction had been effective in these schools, the project analyzed data to see if children who had listened to more radio lessons had learned significantly more math than those who had heard fewer radio lessons.

The schools were divided into two groups, one that had heard more than 10 lessons and another that had heard ten lessons or fewer.

Table 4 Ecuador - Grade 2: Comparison of Learning Gains with More and Fewer Radio Lessons

Number of Lessons Used	Number of Schools	Pretest Mean	Posttest Mean
More than 10	22	46%	64%
10 or fewer	8	48%	48%

Final evaluation showed that radio lessons contributed significantly to the amount children learned. Average test scores for the group with more than ten lessons changed from 46% to 64%, while students in the revised 'control' group showed no gain.

Although the control group presented problems in terms of scientific rigor, there is a positive interpretation for this turn of events. Spontaneous use of the lessons has been seen in other projects in other countries, but rarely so rapidly or so early. Usually months pass before the word is spread, and the use of lessons by volunteers gradually builds momentum over several years. Since minimal effort was spent to promote the math programs in the country, enthusiasm for a good product is the most likely explanation for the fervent and voluntary adoption of the lessons by the control group.

Another positive conclusion from the tests was that students for whom Spanish was a second language could also benefit substantially from them. As in Bolivia, a portion of the Ecuadorian student population is bilingual in Spanish and an Indian language. Yet the tests in Ecuador confirmed earlier results in Bolivia which showed that Indian students generally gain as much as Spanish-speaking children when taught by IRI in Spanish.

Table 5

**Ecuador - Grade 2: Scores of Spanish Speakers
Compared with Indian Language Speakers**

	Number of Students	Pretest Mean	Posttest Mean
Spanish speakers	93	48%	61%
Indian language speakers	58	46%	64%

IMPLEMENTATION STRATEGIES

With the goal of increasing IRI use, the Radio Learning Project has continued to examine its strategy for promoting and implementing IRI. A key element in this effort has been the proven success of IRI. All projects evaluated have proved that primary students show impressive learning gains when IRI is used. These results are testimony to the high quality of IRI lessons. The RLP has made good progress in other areas that are critical to implementation: adaptation, social marketing, local support, and institutional strengthening.

As the project seeks to disseminate IRI technology worldwide (usually to countries with very limited financial resources), the efficiency of the adaptation process has become a critical aspect of cost control. Expertise in the adaptation of previously developed lessons to new cultural situations ensures that lessons will be attractive to new groups of educators and students while remaining financially feasible for their governments. Social marketing research can guide both adaptation and implementation of radio lessons to a new audience. This research can ease the adaptation process by prior assessment of needs and expectations of the target group. Additionally, social marketing can play a key role in garnering local support from donors and government agencies. The introduction of IRI lessons can also be greatly helped by social marketing research and advice on methods of promotion and distribution, to be used by the administering institutions. The institutional strengthening that is gained by these managing organizations through the development and implementation of radio lessons will determine the success and endurance of IRI beyond the life of the RLP.

Learning Gains

During its first three years, the Radio Learning Project has continued to verify that using IRI results in significant improvement in achievement. The evidence in favor of interactive radio has been well documented for different countries and languages. The result for the math programs are shown in Table 6.

**Table 6 Mathematics Achievement in Second Grade
Radio Classes Compared with Traditional Classes**

	Mean Scores		
	Traditional	Radio	Effect Size
Nicaragua	62%	70%	0.52
Thailand			0.41
Central Plain	63	68	
Northeast	44	58	
Bolivia			0.91
Cochabamba	53	71	0.78
Kami	29	49	1.07
Trinidad	42	68	1.47
Honduras	34	52	0.80 ¹

1 The radio classes also used new textbooks. In classes using only new textbooks, the achievement score was 44 with an effect size of .43.

Adaptation

In the process of adapting interactive radio lessons for new situations, RLP staff has gained experience and increased skill in modifying previously developed materials for use in other cultures. Impressive learning gains have continued while the cost of improvement has diminished with each successive adaptation.

The process of adapting lessons to new sites needs to address questions about cost and time frames as well as cultural sensitivity. Greater experience with this in 1988 provided the project with some examples of ways to make the process inexpensive, rapid and still more effective. As described above, the mental arithmetic series developed for Honduran primary schools was quickly modified for a Costa Rican pilot project which began in the last half of 1988. Within a few weeks of a letter of agreement, signed by both countries, the first lessons were being broadcast to the Costa Rican pilot group. This

process required no long-term technical assistance and all changes in lessons could be made with minimal seed money provided by the RLP. The few necessary changes in the recordings were made in the originating country (Honduras), not the recipient country (Costa Rica).

CRECERA (an autonomous part of the Ministry of Education in Ecuador) adapted and recorded the Grade 2 math tapes from the Nicaragua series (1974-78). The result was an improved, high-quality series of lessons for a very successful pilot project in multigrade classrooms.

During 1988, AVANCE adapted lessons for English as a second language for use in bilingual schools. The original lessons from the Kenya RLAP project needed to be edited and adapted to the bilingual situation in Honduras. With assistance from Peace Corps Volunteers, the lessons were revised and recorded. AVANCE hopes to market the lessons commercially throughout the region for use in Spanish/English-speaking areas or in schools where the primary language is Spanish. If the results are successful, these lessons could be used elsewhere with minimal adaptation costs.

Some generalizations can be made about the adaptation process:

- o As RLP personnel gain more experience with adapting IRI lessons, more accurate estimates can be made in terms of time and resources, and technical assistance can be more effectively targeted.
- o Computers have made the process much more efficient, particularly word processing. In addition, "Expert Lesson Planner," the computer software developed by Friend Dialogues, has proven to be a great aid in developing new lessons and, with further refinement, has the potential to assist with adapting lessons.
- o As countries begin to use programs only slightly modified from other nations, other countries may look more carefully at this option in order to reduce costs and speed up the implementation schedule.
- o Countries adapting lessons or developing new programs can try to create lessons that are more generic or regional, i.e. lessons that are not culturally limited to just one country. In this way, institutions such as AVANCE can market IRI products to other countries.

Social Marketing

The RLP is considering various ways to encourage increased use of IRI. One of the tools for rendering implementation more effective is social marketing, which can assist in worldwide dissemination and gather support for IRI within a specific country.

Social marketing grew out of commercial marketing principles and has been in use since the 1950's. Very simply, this type of marketing sells socially beneficial products and

behaviors in much the same way as commercial products are marketed. The social marketing process resembles that of the commercial variety in three ways: 1) it employs standard marketing tools and analysis; 2) it encourages behavior changes, and 3) these changes are sought by appeals to people's self-interest rather than by more authoritarian ways.

In Honduras in particular, social marketing contributed significantly to virtually every stage in the lesson development and implementation process. Because of the RLP's interest in a more systematic marketing approach for promotion of IRI, this section of the Annual Report will review the accomplishments of social marketing with special emphasis on the Honduran activities, which may form a useful paradigm for future IRI projects.

Social Marketing in Honduras

In June of 1987 RLP technical advisors and Honduran staff met in Honduras to discuss the role of social marketing in promoting the work of AVANCE. They decided to create an independent Social Marketing Division to help promote its two major products: the interactive radio arithmetic program and El Agricultor, a newspaper to foster socioeconomic development.

The Social Marketing Division's first concrete activity was a baseline data survey of the RLP's Honduran audience segments. A quantitative "school audit" assessed the education materials available in rural and urban schools, their cost, by whom and where they were obtained. A complementary qualitative study tested different market segments and their attitudes towards the educational system and the interactive radio pilot project. AVANCE team researchers conducted focus groups (group interviews with representatives of a particular market segment) with parents, teachers, children and opinion leaders. Samples of two treatments of the first-grade math course were also tested - *La Familia de los Números* and *The Mayan Magician*.

The quantitative materials survey demonstrated that teachers had very few materials and that most of them were already purchasing materials for use in the classroom. They expressed a willingness to purchase materials, especially if they were of high quality.

The qualitative survey indicated that there was tension between parents and teachers concerning the education of their children. Parents felt that education was the teacher's role, while teachers responded that parents didn't support them in educating their children. This finding was extremely important in the project design. Originally AVANCE had planned to market the interactive radio product to parent-teacher associations or communities and to ask the teachers to organize the community in activities that would raise money for the purchase of materials needed for the radio classes. Both teachers and parents discarded this idea. Teachers were quick to understand that the interactive radio product would a great help to them in the classroom. They did not want to be put in to the position of asking for money from the community for a product which they perceived as benefiting them in particular. The product was therefore marketed directly to teachers.

To incorporate these studies into the implementation process, the Division arranged a two-day workshop for the IRI staff at AVANCE. Each person was given copies of the research studies to review and evaluate, and the staff were assigned to small groups to discuss research results and develop recommendations for future action. In this way the entire production unit was involved in developing the implementation plans. The recommendations from the workshop became the basis of a marketing plan for IRI, submitted by the Division in November, 1988.

The Social Marketing Division extended its work in early 1988 by developing plans for implementing the Grade 1 *La Familia de los Números* (The Numbers Family) in the six largest regions of the country. They established a plan for marketing two radio math kits (one with and one without a radio).

During its first few months of existence, the Division was very productive; the marketing research studies, workshop and marketing plan were completed before the end of 1987. These all contributed to the successful introduction of the project in February 1988.

Social Marketing Activities in Other Countries

Because the Honduran example may be a useful paradigm for other IRI projects, it has been described in detail. But Honduras was not the only project to use marketing techniques; RLP projects in a few other countries also evolved strategies to influence project acceptance.

In Ecuador the RLP studied teachers' needs and their attitudes towards interactive radio instruction before the pilot project. In 1989 following the pilot activity, RLP will sponsor focus groups with teachers (both with and without IRI experience) before designing a large-scale IRI project.

Although couched in terms of ethnographic rather than market research, a Bolivian study gathered information on local health practices and beliefs before designing IRI lessons on child health. The study was completed by an anthropologist but provides a very useful baseline for social marketing efforts. In this instance anthropology and social marketing research differ mainly in their methods of approaching the potential audience, but their conclusions can be of similar value for project implementation. Ethnographic information helped staff draft lessons that would be acceptable to the audience and useful for improved community health.

Building on In-Country Support

During the past year, creative partnerships between the RLP and private, semi-autonomous, and public organizations have been added to those established in 1987. In the interest of learning more about strategies for future cooperation, this section will take a closer look at what the project has learned about institutional strengthening and effectiveness from four joint ventures, all in Latin America. These four cooperative efforts can be divided into two groups, based on the advocacy that launched them: 1) projects

implemented through advocacy of USAID mission officials (Honduras and Bolivia); and 2) projects which originated from host country support (Costa Rica and Ecuador).

Projects Implemented through the Advocacy of A.I.D. Mission Officials

The RLP program in Honduras was initiated by a USAID education officer who wished to include an IRI component in a proposed education project. The Ministry of Education supported the idea, but preferred not to host the project. Instead, USAID housed the project with AVANCE, a private organization that had originally been established by A.I.D. to develop a rural newspaper. AVANCE is now a USAID-supported organization with a broad mandate for the use of mass media in education and social development.

From the beginning, marketing staff in AVANCE actively sought to increase support from the Ministry and to have it make its support public. These marketing efforts and the success of the first phase of implementation earned full Ministry endorsement of the math programs for national implementation in 1989. Through marketing efforts, the RLP was also able to obtain financial contributions from private donor companies. As it prepares for national use of the math programs, AVANCE appears to be the most successful Latin American project to date.

As in Honduras, the Radio Education Project in Bolivia was created at the initiative of a USAID education officer who sought out the RLP to see if IRI might be applicable to Bolivia. Through this officer's initiative, a pilot IRI project was designed and carried out. An important question was which Bolivian organization should host the project. Fé y Alegría, a private Catholic organization, was selected to manage the project. Fé y Alegría administers over 300 primary schools for the Ministry of Education.

Community support of the RLP math project has been remarkable. Parents' groups have been organized in each department to provide continuing support to the Radio Math program. This support has paid off even in the face of teachers' strikes. During 1988 about a month of instruction was lost due to strikes, but in many schools parents assumed the role of the striking teacher during the math lessons. In other areas children were organized into home listening groups.

However, despite community enthusiasm for the radio materials and the good work of the project, competing demands for drug-related programs have jeopardized continued funding from USAID. In addition, education is not a high priority of the mission. In short, with the departure of the USAID mission official who initiated the project, there is neither as complete an understanding of the project, nor as strong a commitment to the radio activities within the mission. This situation is potentially threatening to the success of the project.

Further, the mission and Fé y Alegría have, thus far, deliberately chosen not to work closely with the Ministry of Education on this project. Following the national elections in 1989, the project needs to refine their long-term strategy, taking into account the Ministry

of Education and future funding sources. Broadening the basis of political and financial support would contribute to the security and longevity of the Bolivian project there.

Projects Building on Host Country Support

The two projects in this group, Costa Rica and Ecuador, were developed as a result of host country initiative. The success of these activities has been based on a few key people who were enthusiastic and very capable. Both projects have been adopted by ministries of education and are being administered through organizations that are part of the ministries. The local USAID missions have been supportive in both cases, although only one mission has been able to contribute financially.

Both projects were implemented this year by a remarkably efficient and rapid adaptation process. In each case the ministry of public education had already been working with distance education at a level other than primary schools. The Costa Rican Ministry of Education had previously been using distance education for secondary students. In Ecuador, CRECERA had been employing distance education to provide secondary-level courses in the remote Amazonian region. Because of these efforts, at least part of an infrastructure (equipment, technical assistance, etc.) was already in place for each country. The adoption of an IRI component for primary schools was a continuation of policies already endorsed by the ministries of education.

Institutional Strengthening

Longevity of IRI projects established by the RLP will depend on the vitality of institutions managing these projects after the RLP concludes. While much remains to be discovered about ways to strengthen these supporting organizations, the RLP moved ahead in this regard during 1988.

During the past year, the RLP worked with four local organizations, AVANCE (Honduras), CENADI (Costa Rica), Fé y Alegría (Bolivia), and CRECERA (Ecuador). In each partnership, the RLP was able to enhance the capabilities of the host organization.

AVANCE was founded to support social and economic development. The IRI project strengthened their ability to do this. Perhaps the most sanguine outcome from phase one of the Honduran project was the strength and experience that AVANCE has acquired from it. As a result, it has been able to offer materials and on-site technical assistance to CENADI so that the Honduran series, *La Familia de los Números* could be used in Costa Rica.

CENADI, the new teaching center of the Costa Rican Ministry of Education, was founded in 1988 to improve teacher training and children's education. The IRI was its first project to meet both of these objectives.

In Bolivia, Fé y Alegría was already administering many primary schools for the Ministry of Education, and doing so successfully. Its work with IRI, however, improved

performance in its Grade 2 math classes substantially. The project provided another way for *Fé y Alegría* to present model programs for the rest of the nation.

CRECERA had already been working in distance education during its first two years of existence and was mandated to provide this to all school levels. However, it had not yet expanded its work to Ecuador's primary schools. The IRI project allowed them to work at this level and to expand also into the area of teacher training.

ISSUES FOR 1989

In 1989 the RLP will devote more attention to training teachers. In many of the countries already hosting an IRI project, the number of students is growing so rapidly that the educational infrastructure cannot keep up with demand. Teachers with minimal or no training are expected to prepare increasing numbers of students for more complex work. Enthusiastic responses to the IRI projects by teachers who need help the most indicate that the RLP can provide a real service to teachers inadequately prepared to teach certain subjects. If we are to continue to improve educational quality through our lessons, then teachers and their teaching capabilities must also be involved in these efforts. In 1989 RLP will examine the potential for radio programs to help teachers use the interactive radio programs more competently and give support for teaching during post-broadcast sessions. We hope to involve teachers more as participants and collaborators.

The teacher training efforts will have two main purposes: (a) to help teachers use the IRI programs in their classrooms and (b) to help them better understand and teach difficult topics after the radio broadcasts. Regarding the first purpose, the teachers need to understand factors such as:

- o the role of the IRI lessons in teaching the course objectives, and the relationship between the IRI lessons, and the textbooks or other instructional materials and the teacher
- o the role of the teacher, before, during and after the radio lessons
- o classroom management issues, such as the use of IRI in multigrade classrooms

The second purpose is to improve the capabilities of teachers to teach certain topics during the non-broadcast periods. Such an approach can include both content and methodology. Examples of assistance in math methodology might include how to teach the concepts of place value, or in science, suggestions for demonstrating that air occupies space.

The components of a training program could include a teacher's guide, audio-cassette programs, radio broadcasts, occasional face-to-face meetings, and video technology.

A second theme for the coming year will be increased attention to the use of IRI in the context of broader policy reforms. For example, ministries of education are generally interested in improving the efficiency of the educational system, principally by reducing dropouts and repetitions. The RLP will try to present IRI in the context of such larger

issues and to carry out studies on the impact of IRI on efficiency. It will be important to verify whether a single IRI subject, or perhaps packages of two or three IRI subjects, can improve attendance and the retention rate by maintaining student interest and reducing the likelihood of dropout and repetition. The RLP will also look for opportunities to examine such issues in countries that have, or are planning to have, national examinations at the appropriate level for the IRI programs.

Finally, the RLP should explore new marketing techniques that will elicit interest from funding agencies outside A.I.D. Since certain USAID missions are not able to fund education because of other priorities, locating other funding arrangements could be essential for IRI project success. Our 1988 experience has shown that previously developed programs can be adapted and implemented at very low cost. With proper research, the RLP can in some instances seek financial assistance from sources with more modest means than USAID. Sometimes international donor agencies from other nations may even consider the RLP as a subcontractor to their own distance education projects for IRI technology. The unique approach and proven success of IRI means that even agencies which do not ordinarily fund U.S. services may consider subcontracting with us in order to benefit from the RLP's experience in this educational area.

APPENDIX I

USAGE STUDY

During the last half of 1988, a marketing study was done of Honduran first-grade teachers to evaluate their use of *La Familia de los Números*, the new mental math program designed to supplement textbooks with radio instruction.

From a random sample of 404 teachers, 294 (73%) attended group meetings and participated in the market survey. They were asked whether they had purchased materials for the series, if they were still using the programs, what their reasons were for continuing or stopping the programs, and if they would recommend purchase of the second-grade materials. For each question, the survey sought to link the responses with co-variables, including teacher's level of education, rural vs. urban setting, school size, multigrade classrooms, and teacher purchase of an IRI kit.

Did the teachers purchase and use the program series?

Those who purchased equipment and/or materials for the programs were more likely to come from smaller, multigrade schools in rural settings. They were also more often graduates of normal schools, rather than higher education, and they usually planned to continue to teach in primary school.

Did the teachers purchase the combination (radio/materials) package or the materials alone?

Teachers had two options in materials packages. One package included a radio as well as printed teaching materials. The other provided only the teaching materials on the assumption that some teachers already had radios available to receive the broadcasts which were the backbone of the instruction. Two-thirds of the purchasers had chosen the combination package that included the radio.

Were they still using the series?

Of the purchasers who had used the programs, 59% were still doing so. Sixty three percent (63%) of those who had bought the combination package were still using them, while only 39% of the "materials only" purchasers were still doing so.

What were their reasons for continuing or ending the programs?

One of the best predictors for continued use of *La Familia de los Números* was purchase of the radio/materials combination. Teachers who continued to use the broadcast were more likely to teach several grades in one-room school houses and to work in rural areas. Some reasons given by the respondents for using the math program included its power to motivate students (90%) and its ability to inspire enjoyment of math among students (86%). Teachers also noted that the series helped math teaching (78%), encouraged students to attend class (76%), and to learn the material quickly (65%).

For those who discontinued use, major reasons cited were the lack of coordination between radio programs and textbooks (50%); lack of electricity and batteries (43%); absence of pre-broadcast briefing of teachers on up-coming program topics (41%), and poor quality of broadcast signal (36%). Former users demonstrated several demographic and school variables, but they came most often from schools that had many teachers and they planned to move out of teaching in the future.

Among those who had never used the programs, a significant factor was shortage of radios in certain provinces. Demographic and school variables were probably also important; among this group, there was a slight tendency to work with smaller classes, be younger (18-24), with ambitions to move up or out of the primary school teaching profession.

In sum, Honduran teachers seemed to be attracted to the math program and to continue using it in two situations. First, teachers who had plans to remain in teaching were more likely to buy *La Familia de los Números*. Second, teachers in small, rural multigrade classrooms were the most loyal advocates of the lessons. The importance of the lessons to multigrade teachers supports the goals of recent Costa Rican and Ecuadorian RLP pilot projects that have sought to reach and strengthen this group of teachers.

APPENDIX II

SECOND LATINAMERICAN CONFERENCE ON INTERACTIVE RADIO FINAL REPORT

Place: Tela, Honduras

Date: November 14-18, 1988

Sponsors: Ministry of Education, Honduras
Association for Socioeconomic Advancement and Development
(AVANCE)
Radio Learning Project

Participants: Annex 1

Agenda: Annex 2

Declaration: Annex 3

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We would like to express our appreciation to AVANCE staff, especially Katyna Argueta, for preparation of the conference report.

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Monday, November 14

The conference was opened with comments from the following individuals:

- 1) Dr. Thomas D. Tilson, Director of the Radio Learning Project.
- 2) Henry Reynolds, Education Officer, USAID/Honduras
- 3) Dr. Clifford Block, Director, Office of Education, Bureau for Science and Technology, A.I.D., Washington.
- 4) Dr. José Carleton Corrales, Executive Director of AVANCE.
- 5) Honorable Luís Barahona Donaire, Vice Minister, Secretary of Secretary of Education, Honduras, and the Minister's personal representative.
- 6) Presentation of Delegations.

Following the conference agenda, a demonstration of an interactive radio lesson from "La Familia de los Numeros" was presented. The program was coordinated by Marizela Turcios, assisted by a Honduran teacher and a group of students from the Estéban Guardiola School, located in the County of La Lima.

A panel discussion was given on the "Interactive Radio Methodology: Definition, History, Principles and Case Studies". Moderator: Dr. José Carleton Corrales. David Edgerton discussed the history of interactive radio methodology with respect to the four original interactive radio projects (Nicaragua, Kenya, Dominican Republic and Papua New Guinea). Mr. Edgerton described the extension, adaptation and application of the methodology to other countries.

In a panel on "Curriculum Principles," Dr. Jamesine Friend pointed out the importance of financial considerations and project design costs with regards to project quality control.

Marizela Turcios, in her exposition on Methodological Principles, mentioned the distinctive characteristics of interactive radio (frequent pauses, immediate reinforcement etc.) and the importance of the integrated use of the formative evaluation.

Altagracia Diaz briefly explained the management of the cycle of elaboration, production, and evaluation (EPE): the study of scriptwriting production and formative evaluation, in relation to the experience of the Dominican Republic. She also emphasized the cycle's nature and continuous process, and the importance of organized and coordinated management.

Tuesday, November 15

During the morning, presentations were made on current programs of interactive radio instruction.

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Bolivia: Jaime Reyes Velasquez, Michelle Fryer. Radio Mathematics. Presenters gave a complete view of the Bolivian curriculum, emphasizing the sociological and socio-linguistic characteristics of Bolivia, as well as the existence of diverse indigenous groups in the country. Michelle Fryer mentioned a pilot project in the field of health, which provides information and publicity for oral rehydration therapy for infants.

Ecuador: Juan Auquilla. Radio Mathematics. Future plans. Presented the six-week pilot project that had been conducted in a limited area in Ecuador, with adaptation of the Nicaragua Radio Mathematics Project. They also spoke about the brief experience that they had with the medium of mass communication, especially with the use of radio.

Lesotho: Philip Sedlak. English in Action. The implementation and adaptation of the Kenya Radio Language Arts Project was applied in Lesotho as part of the Basic and Nonformal Education Project (BANFES). The project has proven successful and is at the point of concluding the first year of transmission.

Honduras: Dr. Jose Carleton Corrales. Bay Islands English Project. Explained the special and socio-linguistic peculiarities of this region, from which follow the development of a generic English course for the three primary grades of basic education. This program can be used by any teacher -- English speaker or not -- and must be self-contained in order to facilitate distribution at the national and international levels. Finally, it was explained that this project depends on the cooperation of Peace Corps volunteers in Honduras.

Dominican Republic: Altagracia Diaz de Jesús. Radio-Assisted Community Basic Education (RADECO) This project is the third in the sequence of interactive radio programs, and the only one to date that presents in concentrated form a curriculum for communities without schools and without teachers. The local parents' associations have been responsible for the construction of meeting areas and have designated literate adults to serve as radio program monitors. This project design has proven a successful medium to bring quality education at low cost, especially for the Barahona Region in the southeast of the Dominican Republic.

Papua New Guinea: Steven Koslow. Radio Science Project. This is the fourth project in the interactive radio sequence, focusing on grades 4,5, and 6. The project just completed its first pilot-year of radio transmission and has encountered two fundamental problems: the first was that in order to teach science to children, manual activities are required, and for this, distribution of materials is necessary (string, mirrors, etc.). Distribution of materials has proven a difficult task. The second problem has been geographical: given the nature of the terrain and in view of the fact that Papua New Guinea is an archipelago, of volcanic origin and desert vegetation. As a consequence, communication is difficult.

Costa Rica: Lorenzo Guardamuz, Fernando Castro. Mental Arithmetic. This project is the result of the adaptation of the Honduras Radio Program in Mathematics. AVANCE (Honduras), by means of a contract, has granted rights to the use of materials and minor modifications towards adapting the program to Costa Rican characteristics. The contract includes recording and short-term technical assistance in the areas of evaluation, production, and preparation of scripts. This project works jointly with the National Didactic Center (CENADI), and the Radio Learning Project provides funding.

Following the agenda, workshops were presented.

A- Instructional Design:
Coordinators: David Edgerton and Jamesine Friend.

The workshop was dedicated especially to a presentation of the essential elements of instructional design: interaction, common types of interaction and typical configurations of verbal interaction.

Then delegates participated in a discussion on study planning, design, and formative evaluation. Next, an example was given with general participants as actors. The following themes: principles of presentation and drill, typical forms of interaction, and the use of cues and signals; were not dealt with in the workshop, but notes were distributed among the participants.

B- Teacher Acceptance of Radio Instruction:
Coordinators: Carleton Corrales, Jaime Reyes, Philip Sedlak.

The "Number Family" user study, conducted by the marketing division of AVANCE, was discussed. The study worked with teachers, supervised participants, non-participants and sporadic users. The results showed some problems and benefits of the program perceived by teachers and supervisors.

C- Costs: Development, Adaptation, Implementation, and Maintenance:
Coordinators: Thomas Tilson and Steven Koslow.

This workshop focused on informing participants about the costs of a program of interactive radio instruction; costs of development, implementation, and maintenance. Guidelines were presented for determining costs of adaptation of programs from one country to another, development of new curriculum, and models for cost-benefit analysis; and, computer modes to determine the cost of a new radio program, its development, implementation, and maintenance.

Wednesday, November 16

The following workshop presentations were made:

D- The Second-Language Factor in Interactive Radio
Coordinators: Philip Sedlak, Richard Martin, David Edgerton.

The following are considered in the design of programs:

- a) To know that what is essential is to develop the students learning strategies to their maximum potential.
- b) To have a complete knowledge of the socio-linguistic situation of the learners in the family, in the community, in the schools, in the country, and in the society.
- c) To remember that teaching of a second language is not the same as teaching of the mother tongue.
- d) To give instruction in the mother tongue, before giving instruction in the second language, when this is possible.

E- Summative Evaluation
Coordinators: Gloria Gamero, Michelle Fryer, Steven Koslow

In this workshop a general idea was given of what evaluation is, so as to emphasize the importance of the summative evaluation and of the collecting of the best data possible. It was pointed out that the data should be technically solid, useful, and verifiable. The evaluation design of three projects (Papau New Guinea, Bolivia, Honduras) was presented, in which a rotating design was utilized.

The difficulty in controlling multiple variables in the Papau New Guinea program was emphasized; the method of selecting the sample was analyzed, and examples were given of the application of test results. Results of the Bolivia evaluation were discussed, in which highly significant results were achieved in a comparison of the control and experimental groups.

F- Application of Social Marketing to Interactive Radio Instruction.
Coordinators: Marizela Turcios, Idania de Bravo, Bette Booth

The purpose of this workshop was to give a view of marketing applied to interactive radio. The history of marketing, marketing cycle, identification of different aspects including social marketing were discussed. Examples were given of activities undertaken in "The Number Family," and the workshop concluded with an exercise: applying marketing to the Bolivia experience.

G- Teaching Initial Reading by Radio
Coordinators: Philip Sedlak, Jamesine Friend, Altagracia Diaz de De Jesús

In the design of programs of this nature, the importance of the following was stressed:

- a) To take into account the relationship between spelling and sounds in language and to give emphasis to decoding and sight reading.
- b) The relation between decoding and coding in teaching.
- c) To present materials from simple to complex.
- d) To consider the strategies that good readers use in reading a text as well as the development of schemes, knowledge in general, and job skills.
- e) To keep in mind that comprehension is essential in the reading process.

Thursday, November 17

The conference continued with presentations of the following workshops.

H- Management of the Cycle of Elaboration, Production, and Evaluation (EPE)
Coordinators: Marizela Turcios, Altagracia Diaz de De Jesús, Steve Koslow

Similarities and differences in management of the EPE cycle were presented, explaining each one of the steps that are taken: production, instructional design and evaluation, and in the case of "The Number Family," marketing of the product was added.

I- Formative Evaluation
Coordinators: Jamesine Friend, Emilio Oros, Gloria Gamero.

In this workshop the conceptual framework of formative evaluation and strategies for formative evaluation were analyzed. The importance of this type of evaluation in an interactive radio program was explained. Bolivia presented the revision method, and Honduras, the feedback method. Techniques of observation and application of individual and group tests were detailed.

J- Creative Scriptwriting. Mario Ramirez, David Edgerton. The objectives: To present what the focus of creative writing of educational scripts should be and to present new ideas on this topic. The most relevant conclusions were the following:

- a) The creativity of the scriptwriter ought to be related to the social and economic background that constitutes the limits of the listener.
- b) To use appropriate language (without losing its colonial beauty) for the audience to whom the program is directed. In this regard, it is very useful to obtain an understanding of the basic language, without the damage of trying to add to it later.

K- The Importance of Community Participation in Interactive Radio Education. Betty Barron de Luna, Kurt Hein, Altagracia Díaz de De Jesús.

- a) To emphasize human aspects, trust and confidence in the communities where access is most difficult, so that these communities collaborate without any hesitation.
- b) To work organizationally to further the interests, plans, and needs of the community.
- c) To use strategies for organizing associations of parents', and then involve the entire community.
- d) To permit the parents to drop out without pressure, to be involved spontaneously and naturally.
- e) To involve the community by means of consultation, taking into account local morals and ethics, to obtain the best results.

L- Use of Radio in Teacher Training. Dwight Holmes, Molly Teas, Philip Sedlak. The experience of Nepal was presented as a case study, making the following points and recommendations:

- a) Interaction helps and makes more lively the radio transmission for teachers.
- b) Formative evaluation is a requirement in instructional design.
- c) All supporting materials and contact sessions are important.

- d) It is necessary to have a complete packet that includes: transmissions, supporting materials, monitoring system and incentives.

In addition, thirteen recommendations were given for implementation.

M- Radio Production. Carlos Zelaya, Jonathan Schwartz, Ricardo Wray. The following conclusions were reached:

- a) Production quality has a strong influence on programs
- b) The producer ought to know the use of radio conventions first-hand as a requirement of the recording session.
- c) Pre-production is fundamental.
- d) Collaboration of the whole team is very important to assure the success of the work.
- e) Attention to technique is essential.

Ten "golden rules" were given for production, and it was suggested that teams meet and exchange ideas, techniques, resources, and research.

N- Experiences in the Adaptation of Interactive Radio Programs. Filemon Heredia, Grace Rojas, Juan Auquilla, David Edgerton. The workshop was presented as a panel.

1. Bolivia made a presentation of its adaptation of the original mathematics project in Nicaragua. They discussed the following points:

- a) adaptation of scripts in the proper medium
- b) consideration of the child
- c) didactic and methodological principles
- d) creativity and communication.

2. Costa Rica. Adaptation of "The Number Family" from AVANCE in Honduras. They concluded that adaptation helped them to reduce costs, as with personal contributions and few resources they were able to do much; however, today they need funds for the expansion phase. Little adaptation has been necessary, in view of the numerous characteristics in common between the two countries.

3. Honduras. Adaptation of the Radio Language Arts Project from Kenya required the following:

- a) A change of characters, geography, etc., in accordance with the pilot region (Bay Islands of Honduras);
- b) Syntactic, semantic, and morphological modifications from the manner of speaking in Kenya to that of the United States.

Objectives of the program are as follows.

- a) To give assistance to the Bay Islands;
 - b) To offer the program for sale to private schools.
4. Ecuador: Replication of the mathematics project from Nicaragua, in accordance with legal, pedagogical, and technical criteria.

Friday, November 18

Workshops were completed with the following final presentations:

- O- Institutionalization of Interactive Radio Education Programs. Carleton Corrales, Altagracia Díaz de De Jesús, Juan Auquilla.

General Commentary. When beginning a program of this nature it was made evident that two situations ought to be taken into account:

- a) Financing ought to be obtained, that has political support, and that gets the project started as a dependent entity under the responsibility of an office, division, or institution.
- b) The program should be conceived as a program of the Ministry of Education and that the ministry should assist it on a legal and economic basis.
 - 1. Dominican Republic. RADECO was born as an experimental project, under the administration of an international and a national organization, financed by A.I.D. At the end of its first two years, the Ministry of Education would assume financial and legal responsibility for the project.
 - 2. Ecuador. This project works within an executing organization: CRECERA. In the initial stage there were internal problems of functioning and economics. Now the project reaches 3,000 teachers, and 100,000 children and parents.
 - 3. Costa Rica. Begun in CENADI, the project is currently in an experimental phase, and it is proposed to expand it to 800 schools.
 - 4. Honduras. AVANCE, by means of a signed agreement with the Ministry of Education, promotes the improvement of education (one of the eight components of the project). Costs were high at the beginning but have diminished with the participation of the private sector, and by its expansion it is hoped they will be reduced even more. The project depends on the assistance of the Ministry of Education, and if the ministry would like to assume responsibility for the program, AVANCE would assist.

Following the program, strategies for development of A.I.D. programs were presented.

Nadine Dutcher, education officer for USAID/Honduras, made a special point of the fact that A.I.D. is according a growing importance to education, especially primary education, based above all on the new policy formulated by the Congress of the United States. She expressed further that within primary education, A.I.D. is emphasizing non-conventional methodologies, which interactive radio projects feature, so today prospects are good.

Gilberto Mendez, education officer for USAID/Guatemala, indicated that he was very impressed both with the potential of interactive radio and to have discussed the options that this project offers to the design of similar projects in Guatemala.

Next, the plenary session was held.

Plenary Session:

- A) The Guatemala delegation made a presentation, summarizing the situation in their country, and emphasizing the indicators of school desertion, repetition and the low quality of education. They explained that the educational infrastructure is not being fully utilized; to contribute to the solution to this problem, the use of interactive radio will be proposed.
- B) A summary was given of all the workshops that had been presented at the conference.
- C) The following conclusions and recommendations were made:
 - 1) That a future meeting of universal character be held, for the analysis of work policies and the consolidation of interactive radio.
 - 2) To find a common ground for a better relationship among the entities, the exchange of experiences, materials, accomplishments and problems.
 - 3) Organizers were congratulated for the success of the meeting.
 - 4) In view of the fact that at times many resources and strengths are lost in the pilot experiences, it was suggested that an entity be formed that gives them continuity, finding the mechanism to do it: a federation of associations that work with interactive radio.
 - 5) That donation of radio spots on public radio broadcasts be solicited from the governments of different countries for educational programs.
 - 6) To furnish information to the different countries, so that it can be published in the newspaper El Agricultor ("The Agriculturalist"), and the rest of the countries acquire the information by purchase of the newspaper.
 - 7) That a bulletin be published, about what is happening in the different countries with interactive radio projects.
 - 8) That a commission be named to write a concrete proposal, comprising the following persons: Juan Auquilla, Grace Rojas, Fernando Castro, Jaime Reyes, and Marizela Turcios.

Finally, closing ceremonies were held for the Second Interamerican Conference on Interactive Radio, with the participation of the following persons:

- 1) Ada Leticia Vega, Director General of Planning and Educational Reform, and personal representative of the Minister of Education of Honduras.
- 2) Marizela Turcios, Director of the Interactive System of Education (SEI) and designated by the commission to read the Declaration of the Second Conference on Interactive Radio.
- 3) Miriam Castaneda, Education Officer for USAID/Guatemala, spoke in the name of the participants.
- 4) Thomas D. Tilson, Director of the Radio Learning Project.
- 5) Carleton Corrales, General Manager of AVANCE.
- 6) Presentation of certificates of participation.

ANNEX I

LIST OF ADDRESSES FOR PARTICIPANTS OF THE
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ANNEX 2

SECOND LATIN AMERICAN CONFERENCE ON INTERACTIVE RADIO
NOVEMBER 14-18, 1988
TELA, HONDURAS

AGENDA

Monday, November 14, 1988

8:30 - 10:30

Inauguration:

- * Thomas D. Tilson, Director, Radio Learning Project
- * Henry Reynolds, Education Officer, USAID/Honduras
- * Clifford Block, Director, Office of Education, A.I.D., Washington
- * José Carleton Corrales, General Manager, AVANCE
- * Honorable Luís Barahona Donaire, Vice Minister, Secretary of Education and personal representative of the Minister

Presentation of delegations

Coffee

10:45 - 12:30

Presentation of the Numbers Family, Honduras:
Marizela Turcios, AVANCE/SEI

Sample lesson with children
Honduran teacher
Technical presentations

Lunch

2:30 - 5:00

Panel: "Methodologies in Interactive Radio: Definition, History,
Principles, Case Studies"

Moderator: José Carleton Corrales
History: David Edgerton
Video of the RLAP project, Kenya
Principles of Curriculum: Jamesine Friend

Coffee

Principles of Methodology: Marizela Turcios
SPE Cycle/Management: Altagracia Díaz de De Jesús

Discussion

5:00 - 5:30

Country Planning Preview Session:
José Carleton Corrales and Thomas Tilson

7:30

Reception

Tuesday, November 15, 1988

8:30 - 10:30 Current IRI programs: Overviews and key issues

BOLIVIA: Jaime Reyes Velasquez and Michelle Fryer (40 minutes)
Radio mathematics, including videotape
Radio health

ECUADOR: Juan Auquilla (30 minutes)
Radio mathematics
Future plans

LESOTHO: Philip Sedlak (20 minutes)
"English in Action"

HONDURAS: José Carleton Corrales (20 minutes)
Bay Islands Radio English Project

Coffee

10:45 - 12:30

DOMINICAN REPUBLIC: Altagracia Díaz de De Jesús
RADECO - Radio community schools
Spanish reading and writing

PAPUA NEW GUINEA: Steven Koslow (30 minutes)
Radio Science Project

COSTA RICA: Fernando Castro (20 minutes)
Mental arithmetic

Lunch

2:30 - 4:30

WORKSHOPS

A. Instructional Design
David Edgerton and Jamesine Friend

2:30 - 3:30

B. Teacher Acceptance of Interactive Radio Instruction
José Carleton Corrales, Jaime Reyes Velasquez, Philip Sedlak

3:30 - 4:30

C. Costs: Development, adaptation, implementation and maintenance:
Thomas Tilson and Steve Koslow

4:30 - 5:00 Radio mathematics project video

5:00 Program planning for country teams

Wednesday, November 16, 1988

8:30 - 10:15 WORKSHOPS

D. The Second-language Factor in Interactive Radio Instruction
Philip Sedlak, Richard Martin, David Edgerton

E. Summative Evaluation
Gloria Gamero, Steven Koslow, Michelle Fryer

10:30 - 12:30 Visit to "Lancetilla" Botanical Gardens

12:30 - 2:00 Lunch at "Turicentro Lancetilla" Restaurant

3:00 - 5:00 WORKSHOPS

F. Applying Social Marketing to Interactive Radio Instruction
Bette Booth, Idania de Bravo, Marizela Turcios

G. Teaching of Initial Reading by Radio
Philip Sedlak, Jamesine Friend, Altagracia Díaz de De Jesús

5:00 Videotape on Honduras marketing

7:30 Barbecue

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Thursday, November 17, 1988

8:30 - 10:30 WORKSHOPS

H. Management of SPE Cycle
Marizela Turcios, Altagracia Díaz de De Jesús, Steven Koslow

I. Formative Evaluation
Jamesine Friend, Gloria Gamero, Emilio Orós

Coffee

10:45 - 12:30 WORKSHOPS

J. Creative Scriptwriting
Mario Ramirez, David Edgerton

10:45 - 11:45

K. Community Involvement
Betty Barron de Luna, Kurt Hein, Altagracia Díaz de De Jesús

11:45 - 12:30

L. Use of Radio in In-service Teacher Training
Dwight Holmes and Molly Teas

Lunch

2:30 - 4:30

M. Radio Production I
Jonathan Schwartz, Carlos Zelaya, Ricardo Wray

N. Adapting IRI programs
Filemon Heredia, Grace Rojas, Juan Auquilla, David Edgerton

4:30 Video on RADECO project

5:00 Program planning for country teams

Friday, November 18, 1988

8:30 - 10:15 WORKSHOPS

- O. Radio Production II
Jonathan Schwartz, Carlos Zelaya, Ricardo Wray

- P. Institutionalizing IRI
Jose Carleton Corrales, Altagracia Díaz de De Jesús,
Juan Auquilla, Lorenzo Guadamuz

Coffee

10:45 - 12:30 Program Development Strategies

USAID

Nadine Dutcher (Honduras)
Gilberto Mendez (Guatemala)

Lunch

2:30 - 4:30 Plenary Session

- * Reports on Country Plan, Next Steps
- * Summary and Conclusions of the Second Interamerican
- * Conference on Interactive Radio

7:00

Clausura:

- * Ada Leticia Vega, General Director for Planning and Educational Reform, and personal representative of the Minister of Education, Honduras
- * Marizela Turcios, Director of SEI
- * Miriam Castañeda, Education Officer, USAID/Guatemala
- * Thomas Tilson, Director, Radio Learning Project
- * José Carleton Corrales, General Manager of AVANCE

Presentation of certificates of participation.

7:30 Formal Dinner and Closing

ANNEX 3

AGREEMENT OF THE SECOND LATIN AMERICAN CONFERENCE
ON INTERACTIVE RADIO
14 - 18 NOVEMBER 1988
TELA, HONDURAS

COMMISSION

MARIZELA TURCIOS

GRACE ROJAS

FERNANDO CASTRO

JAIME REYES

JUAN AUQUILLA

HONDURAS

COSTA RICA

COSTA RICA

BOLIVIA

ECUADOR

DECLARATION OF THE SECOND LATIN AMERICAN CONFERENCE ON INTERACTIVE RADIO

The participants of the Second Latin American Conference on Interactive Radio, representing educational institutions in Bolivia, Ecuador, Costa Rica, Honduras, Guatemala, El Salvador, Dominican Republic, Belize, Swaziland, Kenya, Nepal and Malawi, hereby resolve that they:

Are aware that education, science and technology must be utilized to achieve people's material and spiritual well-being;

Recognize the benefits of technical collaboration, through the development of experimental and innovative programs and the transfer of technology through public and private institutions;

Desire to strengthen the linkages between participants and the countries they represent;

Acknowledge the assistance of the Agency for International Development and the Radio Learning Project for the development of programs in countries that are using interactive radio instruction.

The participants hereby declare that they:

1. Salute the pioneering work of Dr. Clifford Block and Dr. Jamesine Friend in interactive radio instruction.
2. Support the creation of a Latin American institution which will serve as a communication center for IRI activities.
3. Hereby entitle this institution the "Latin American Technical Commission on Interactive Radio Instruction."
4. Establish a commission of IRI project directors, who will have the right to decide who else may be nominated as members.
5. Name the members of the Directorate of the Latin American Technical Commission on Interactive Radio Instruction.
6. Establish a two-year rotating seat of the commission, with the concurrence of the participating countries.
7. Delegate AVANCE, our host institution, as the initial seat.
8. Charge the directors of the commission with the immediate development of a work plan.
9. Request that the institutions involved support the implementation of this initiative.

Dated and signed in the city of Tela, Atlantida, Honduras, the 18th of November, 1988.

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APPENDIX III

RECENT PROJECT PUBLICATIONS AND PRESENTATIONS

Booth, E. and Corrales, J. C. "Social Marketing + Radio = Educational Success." Development Communication Report No. 62, 1988/3.

Clearinghouse on Development Communication. Interactive Radio Handbook: A Guide to Planning and Implementation, Washington, D.C. 1988.

Friend, Jamesine. "Interactive Radio Instruction: Developing Instructional Methods." British Journal of Educational Technology, Volume 20, No. 2, 1989.

_____. "The Development of Instructional Methods Used in Interactive Radio Instruction." Technical Report No. 801, Friend Dialogues, Shelby, North Carolina, August 1988.

_____. "Curriculum Design for Interactive Radio." Paper presented at the Second Latin American Conference on Interactive Radio in Tela, Honduras, November 1988.

_____. "Quality in Instructional Messages." Paper presented at the Second Latin American Conference on Interactive Radio in Tela, Honduras, November 1988.

_____. "The Quality of Instructional Messages." Development Communication Report No. 63, 1988.

Eshgh, R., Hoxeng, J., Provenzano, J., and Casals, B., Editors. Radio-Assisted Community Basic Education (RADECO): U.S. Agency for International Development. Duquesne University Press, Pittsburgh, Pennsylvania, 1988.

Sedlak, Philip A.S. "Teaching Initial Reading by Radio." Paper presented at the Second Latin American Conference on Interactive Radio in Tela, Honduras, November 1988.

Teas, Molly. "Use of Radio for In-Service Teacher Training in Developing Countries." Paper presented at the Second Latin American Conference on Interactive Radio in Tela, Honduras, November 1988.

Teas, M. and Tilson, T. D. "Bolivia: Instruction through Interactive Radio." Mothers and Children, Volume VII, No. 1, 1989.

Tilson, Thomas D. "Interactive Radio Providing Education in Remote Areas." Action for Children: A Publication of the NGO Committee on UNICEF No. 4, Volume III, 1988.

_____. "Issues Affecting Implementation of Educational Innovations: Case Studies of Interactive Radio Instruction." Paper presented at the Comparative and International Education Society Annual Conference, Atlanta, Georgia, March 1988.

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_____ "Interactive Radio Instruction: Costs and Other Factors in Implementation." Paper presented at the World Bank Economic Development Seminar, Washington, D.C., April 1988.

_____ "Interactive Radio: Costs for Development, Adaptation, Implementation, and Maintenance." Paper presented at the Second Latin American Conference on Interactive Radio, Tela, Honduras, November 1988.

_____ "Interactive Radio Instruction in the Developing World." Paper presented at the 30th Anniversary Symposium, Education Development Center, December 1988.

APPENDIX IV

TECHNICAL BRIEFS AND NOTES

Technical Briefs

Why Radio?

The Role of Classroom Teachers in Interactive Radio Instruction

Why Interactive Radio Lessons are Effective

Interactive Radio and Student Achievement

Teaching Reading by Radio

Teaching Mathematics by Radio

Technical Notes

Bolivia

Costa Rica

Ecuador

Honduras

Kenya

Lesotho

Nicaragua

Thailand

Papua New Guinea

ACRONYMS

AED	Academy for Educational Development
A.I.D.	Agency for International Development, Washington, D.C.
AIDAB	Australian International Development Assistance Bureau
AVANCE	La Asociación de Promoción y Desarrollo Socioeconómico
BANFES	Basic and Non-Formal Education Systems
CENADI	Centro Nacional de Didáctica
CIES	Comparative and International Education Society
CRECERA	Centro Regional de Comunicación Educativa para la Región Amazónica
EDC	Education Development Center
IEES	Improving the Efficiency of Educational Systems
IEL	Improving the Efficiency of Learning
IRI	Interactive Radio Instruction
RLAP	Radio Language Arts Project, Kenya
RLP	Radio Learning Project
RSP	Radio Science Project
UNED	National Distance Education University of Costa Rica
URTNA	Union of National Radio and Television Organizations of Africa
USAID	U.S. Agency for International Development Mission