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ABSTRACT
              Varied development projects in several countries are
described in this newsletter, which also provides current reviews of
development books, and publications available from the Non-Formal
Education Information Center at Michigan State University and ERIC.
The following articles are included: (1) "From Oral Traditions to
Elementary Textbooks: A Description of the Maternal Languages Project
in Niger," Connie L. Stephens; (2) "Formative Evaluation in
Educational Radio and Television: A Fundamental Need in Developing
Countries," Gale R. Adkins; (3) "Community Radio in Ecuador: Playing
Local Music, Strengthening Cultural Ties," Kurt Hein; (4) "IEC
(Information, Education, and Communication) Planning: Eight
State-of-the-Art Principles," John Middleton; (5) "Two Thoughts on
the Use of Microcomputers in Developing Countries," Kurt Moses; (6)
"Numeracy Project Makes New Use of Pocket Calculators," Mary Dickie;
and (7) "Agricultural Extension and Mass Media," Hilary Perraton.
(LMM)

development communication report

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From Oral Traditions to Elementary Textbooks: A Description of the Maternal Languages Project in Niger

by Connie L. Stephens

The Sahelian Republic of Niger is one of many African nations working to reform a school curriculum inherited from the colonial experience. Introduction of maternal language (mother tongue) instruction at the primary level is being tried across the continent, especially in French-legacy nations. (British-legacy states often inherited primary maternal language instruction as an element of "indirect rule," but no word of any language but French was sanctioned in French colonial classrooms.) Niger's neighbors, Togo, Upper Volta, and Senegal, are currently developing maternal language instruction, sometimes as a subject matter and sometimes as the medium of instruction.

Multiple advantages, both pedagogical and cultural, are cited for teaching literacy in a child's mother tongue before introducing a foreign language. Maternal language literacy should be easier to retain both because these languages of childhood are constantly used, and because their newly developed spellings remain largely phonetic, making them easy to write. Additionally, teachers find that French is mastered more quickly by students who already read and write their own language. Subjects like arithmetic are covered much more rapidly in the early grades when they can be taught in a familiar, not a foreign-language, vocabulary.

Parents can more readily participate in their children's schooling when they share the language of instruction. An appreciation for the values and skills vital to the rural areas where most students will live is better communicated in the community's indigenous language and oral art forms. Despite economists' concern about the growth of the private as well as the public sector, the goal of most Africans with a French education is to obtain a civil service position. Properly planned, a bilingual curriculum could help to diversify students' expectations and qualifications.

Drop-out rates in Niger's traditional schools are high; less than a third of primary students go on to secondary school, and many leave earlier. The school leavers have mastered only a limited amount of French, and this often atrophies from disuse, especially among village women. They have oral skills in their mother tongue, but their literacy is restricted to inadequate French.

Within a broader context of educational reform, Niger is experimenting with maternal language instruction in grades one to three. In these early grades, some 25 experimental schools distributed throughout the country are using one of five national languages—Hausa, Zarma-Songhai, Fulfulde, Tamajaq or Kanuri—as the language of instruction. French is not introduced until the later grades, when it becomes the medium of instruction and of standardized examinations, as in traditional schools.

The curriculum in these experimental schools for the early grades is also innovative, and favors an interdisciplinary approach. Lessons in various subjects are linked at any given time by a theme selected by teachers and students. The school year progresses through a series of themes related to the children's community. Examples include: the blacksmith, the market, marriage ceremonies, and domestic animals. Practical, manual activities are taught with the goal of presenting applied as well as theoretical training. For almost a decade, teachers have been forced to improvise their own teaching materials since no appropriate textbooks existed.

In this context, INDRAP (Institut National de Documentation, de Recherches, et d'Animation Pedagogiques), Niger's national pedagogical institute, in collaboration with USAID, designed a textbook project which was built around a recorded collection of oral traditions. Once assembled, this collection served as a resource to draw on for production of readers for grades one through three. These readers provide content appropriate to the curriculum described above, and serve as an archive of oral traditions for future use.

The Institute's procedure for producing elementary readers in maternal languages has not only yielded the desired books, but has also facilitated institutional development in several Nigerien organizations committed to producing national language materials. The project has had several phases, including: a) the collection, transcription, and cataloging of oral materials, b) the preselection, adaptation, final editing, and illustration of texts, c) the publication of the textbooks, d) the evaluation of the textbooks.

Over 70 primary school teachers participated in the collection phase during the summer vacation of 1981. Most teachers spend their vacation in the villages where they grew up and were thus able to record oral histo-

(continued from page 1)
ties, folktales, songs, games, riddles, proverbs, and personal narratives from performers they knew well. For centuries these oral arts have constituted one element of Africa's informal education system.

The 70 teachers were selected to assure a distribution of regions and dialects for each of the five languages. Teachers from experimental schools were given priority, with instructors from traditional schools and four Hausa-speaking adults who had graduated from adult literacy courses making up the rest of the group gathering oral traditions.

Participants were divided between two training centers according to language groups. The Zarma, Tamajaq, and Fulfulde collectors were trained and supervised from INDRAP in the capital city of Niamey, while the Hausa and Kanuri groups worked from the Teachers' College in the departmental seat of Zinder, in central Niger. The two weeks of training in each center included language transcription (the writing down of the oral language), research methods (especially data recording and cataloging), tape recorder use and maintenance, and the appreciation of literature and oral traditions in these languages.

The use of Hausa was notably encouraged by the four adult literacy participants during that group's training. Since, unlike the teachers, they were not francophone, nearly all coursework was conducted in Hausa. Such situations encourage the invention and standardization of technical terminology in national languages, an ongoing need in the maternal language education effort.

Before returning to their villages, trainees were issued small Panasonic RQ 230 9A tape recorders, batteries, and a box of 20 cassettes. Supervisory teams composed of at least one linguist and one pedagogical advisor visited each collector twice during the following two months.

The first supervisory visit involved a careful examination of the collector's transcription and cataloguing methods. Since major transcription difficulties us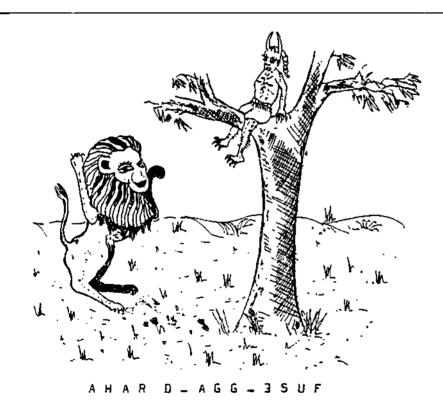ually stemmed from incorrect word division, the INDRAP staff recognized the need for pedagogical grammars to clarify these rules. The information recorded as research data included the performer's name, gender, and age; the genre and title of the selection; the performance site and audience; and a number corresponding to the pre-established cataloging code. The code indicated both the collector and the dialect area in which he or she recorded.

Using such a cataloging system was new to most researchers, but would prove crucial once the tapes were assembled at INDRAP. Without this information, access to the recordings would be impossible and future use for historical or other teaching materials would be jeopardized. We explained to participants that no payment could be made for recorded tapes without accompanying data, since a secondary objective of the summer's work was to amass a recorded archive. Most of them came to understand that their written data for the catalogue was as important as the recordings they collected.

During the second supervisory visit, materials were collected and the field researchers paid. They received four times the amount for transcribing a cassette as they did for recording it. Throughout the project, such piecework payment proved satisfactory for a variety of tasks (recording, transcribing, editing, illustrating). Collectors who had recorded ten or more cassettes were given a small lump sum intended as reimbursement for gifts to performers.

When all the cassettes were assembled at INDRAP, they were labeled and cataloged broadly, by language and dialect, and more specifically, by genre and title. Secondary school leavers were recruited and trained as transcribers to continue this huge task. Paid at the same rate as their teacher predecessors, they were permitted to check out tape recorders, since INDRAP's physical facilities are limited. The best transcriptions resulted when their early work was rigorously reviewed, both for fidelity to the recording and for correct transcription. In addition to advice on word division problems, they often needed guidance on paragraphing and punctuation, since their schooling in French was relatively limited. Some transcriptions had to be redone, but this time and effort invested by INDRAP's staff produced encouraging results. The broader project goal of increasing the number of Nigerien personnel who were literate in national languages was also advanced. Several students enrolled in national language courses at the National Administration School worked on the project as well.

Near the end of the school year, preparations began for a two-week working seminar in August. Seminar participants would review and revise pre-edited texts for final publication. Prior to the seminar, texts for the proposed books were selected on the basis of

A H A R   D _ A G G _ 3 S U F

Agg-asuf eraw fal afalla an tadghamt, ahar

da, illa daw-as eraw, anta Anaba ira egashek

n-ahar a da, inkar s-amadal isabbalalaq. As

ijawankat ahar, iggad Anaba iftan tadghamt,

inkar as tabalulaq nad n-amadal, iget ghur

Drawings by local artists illustrate the folktales newly transcribed and written by the Text Preparation Project in Niger. The language shown here is Tamajaq.

Formative Evaluation in Educational Radio and Television: A Fundamental Need in Developing Countries

by Gale R. Adkins

There are many factors which influence Third World countries to fashion their radio and television programming after that of the United States and Western Europe. Increasingly this Western-type programming is being viewed as a mistake, and local audiences are calling for more locally relevant radio and television. Formative evaluation can be a very important corrective tool.

Where radio and television have been used for educational and developmental purposes in Third World nations, voices increasingly call for programs with a more realistic approach, better designed for actual needs, and more appropriate to the interests and psychology of the target audiences. These are rejections of assumptions made by producers who are either acting upon the wrong conclusions about the audience or who have simply overlooked factors of importance. Consider these comments:

From the Director of Audience Research, Sri Lanka Broadcasting Corporation: "It would be useful to find out which goals the target audience would really like to achieve. Equally important is to find out how the listeners are likely to perceive messages. . . . Another aspect which needs attention is knowing which messages appeal and which do not."

From the Director of Farm Programming, Radio Bangladesh: "Radio Bangladesh was particularly keen to establish the characteristics of the target audience, their information needs and what kind of programmes interest them most, what the barriers are in communicating the message through radio, what kind of information is considered most credible. . . ."

From an educator at the University of Hyderabad, India: "The most formidable problem . . . is that the majority of programmes are not based on need . . . Programmes on obesity transmitted to hungry labourers, for example, speak for themselves in terms of irrelevance . . . Message factors such as confidence, credibility, and persuasive conclusions are altogether neglected . . . Programmes are produced in isolation from broader social realities . . ."

These are, in fact, calls for formative evaluation, or, as it is also called, formative research. What is formative evaluation? As applied to radio and television programs, the term refers to a broad range of systematic investigations calculated to produce guidelines leading to the program form, content, and manner of presentation that will most effectively accomplish the defined purposes of a program. In the most basic terms, decisions concerning how to reach the audience, what needs to serve, and how best to achieve message understanding and acceptance can be made on the basis of data derived from the intended audience. Materials can be tailored for the actual users instead of being modeled after programs produced elsewhere in the world for people of different backgrounds, needs, and preferences. Assumptions and guesswork are replaced by interpreted data and empirical evidence.

Areas of Formative Evaluation

What kind of undertakings are involved in formative evaluation? What is actually done? A classification of formative evaluation activities will show the range of concern as well as indicate the purposes and functions that formative research can be used to serve.

1. *Context analysis.* An inventory of characteristics of the total environment in which a proposed program series will exist—aspects of culture, language, village life, economy, literacy, traditional information sources, education, politics, and media use patterns. Consideration of what these realities will mean in the use of and response to the programs.

2. *Needs assessment.* Identification of needs the radio or television programs might serve, establishment of priorities, and a decision as to the precise needs they will undertake to serve in view of all conditions. This leads to the formulation of specific goals and objectives.

3. *Problems analysis.* Examination of the root causes of the needs to be served and the problems behind those needs. An attempt to understand more profoundly the origins and dimensions of the needs the programs will address.

4. *Audience characteristics.* The nature of the target audience in terms of age, entry-level knowledge, vocabulary, biases and predispositions, conceptual structures, credibility factors, motivations, interests, value systems, attention span, and other relevant elements of audience profile.

5. *Delivery system constraints.* Recognition of limitations stemming from the medium used: viewing or listening conditions; nature and dependability of receiving equipment; credibility of the medium; need for reinforcing or interacting systems.

6. *Communication content and strategies.* Selection of the design and content that is most appropriate to achieve the designated goals and objectives. Selection of the means and devices for presenting that content. Generating alternative strategies of presentation and testing alternatives to provide bases for decisions. Research-based answers may be sought concerning such matters as choice of program format, program length, segment length, choice of talent or music, amount of entertainment content, amount of new informational content, choice and presentation of visuals, integration of program elements, amount and means of repetition, comprehensibility, attention-holding power, activity-eliciting potential, integration of supporting media materials, and identification of communication barriers.

7. *Input and feedback systems.* Establishment of either short-term or continuing systems to solicit response from audience groups, classroom teachers, or other qualified observers. Such feedback can be useful in the evaluation of such things as audience appeal, fulfillment of needs, and nature and extent of utilization. Results would be fed immediately into the production process as a guide to further planning and decision making.

8. *Utilization factors.* Determining how the program content is really being used. Careful examination should reveal things that work especially well and things that do not. Inspecting the relationships between the radio or TV program, supporting media materials, and other active sources of information and influence. Determining what changes are needed to improve utilization and obtain better results.

Some Guidelines for Formative Evaluation Activities

Set Research Priorities. It may seem that formative evaluation for a broadcast series could become as complicated, time-consuming, and expensive as the production project itself. Is it practical and realistic to employ such methods? Fortunately, the role of research in program preparation need not be a matter of full-scale use or none at all. Obtaining a research-based answer to one key question regarding how a program is to be done is using formative evaluation and reducing the guesswork. Only in an ideal situation not yet known to exist could one expect to have research resolve every dilemma along the path of program planning and production. Research priorities can be established and those questions that seem to be most important can be given the available formative research attention. Moreover, findings obtained in one investigation will often be applicable in future situations, and the stockpile of research-based guidelines begins to grow.

Community Radio in Ecuador Playing Local Music, Strengthening Cultural Ties

by Kurt Hein

Two previous articles (see *DCR* 40, December 1982, and *DCR* 42, June 1983) examined some of the reasons for the success of Radio Baha'i, a community radio station serving the rural, indigenous population in the vicinity of Otavalo, Ecuador:

- it broadcasts predominantly in Quichua, the home language of the audience, while other stations broadcast almost exclusively in Spanish;
- most of the staff, including several women, are recruited from among the local people;
- it places a priority on program content over sophisticated broadcast technology; the equipment is a far cry from "state-of-the-art;"
- the staff, many of whom are illiterate, had no prior training in broadcasting;
- its innovative news programming focuses exclusively on information of interest to the *campesinos* (rural peasants);
- it serves as a credible change agent by ensuring that the development messages it broadcasts are appropriate and relevant to the needs of the audience.

Such policies demonstrate the station's commitment to its audience, but the station's effectiveness is wholly dependent upon the creation and maintenance of a large and loyal listenership. Perhaps the most significant factor thus far contributing to Radio Baha'i's success, and the main reason for its popularity, has been its commitment to playing indigenous music.

Radio Baha'i has played a significant role in revitalizing traditional music through its programming and through its sponsorship of what has become Ecuador's most popular festival of traditional music.

The primary attraction of radio for the *campesinos*, as for listeners everywhere, is unquestionably music. They prefer national and indigenous musical selections to the "pop music" most often identified with Western stars. The most popular tunes among the *campesinos* are the "pasillos," "albazos," and "sanjuanitos," which use a variety of instruments, all of which are associated with Andean music. The stringed instruments are usually the guitar and the *charango*, (often likened to a ukelele, using an armadillo shell as the resonating chamber). Wind instruments include the cane flute and the *rondador*, which is a series of pipes bound together.

At the time Radio Baha'i initiated its broadcasts in 1977, traditional Andean Indian music was experiencing a serious decline. This was largely due to the fact that commercial radio stations, the primary source of music programs, aim at the wealthier white and *mestizo* markets. The powerful Quito stations broadcast predominantly "pop music," which the smaller, rural stations increasingly were imitating. This offered the *campesinos* little opportunity to hear the kinds of indigenous and regional music that most appealed to them.

This lack of air time also had a negative impact on the popularity of indigenous groups and their recordings. By the late 1970s, about the only place one could hear traditional music forms in Ecuador was at major festivals and at tourist-oriented nightclubs.

As part of its conscious attempt to serve the *campesino*, Radio Baha'i decided that it would broadcast traditional music exclusively. This decision has been carried out in two ways. First, the great majority of programming on Radio Baha'i (approximately 60 percent) is music. All music programs on the station are pre-recorded, drawing on the station's extensive, continually expanding library of recordings from the Andean region (including Ecuador, Colombia, Peru, Bolivia, and Chile.)

Second, beginning with the festival celebrating its inauguration, Radio Baha'i has sponsored an annual festival of traditional Andean music, "Nucanchic Tono" ("Our Music"). The first year of the festival, only 13 groups that played traditional Andean music could be located in the Otavalo region, and several of these had been formed for the purpose of participating in the competition. Nonetheless, approximately 700 people attended that inaugural festival.

The festival's popularity grew rapidly. In 1982, more than 35 groups registered to participate. This necessitated holding preliminary "elimination rounds" for the festival. The staff decided that the best place to conduct the preliminary rounds was in rural villages. Community leaders were approached by station staff and formal requests were made to conduct "mini-festivals" in the community.

For most of the communities, it was the first time such an event had been brought to their village. On the day of a preliminary festival, portable sound equipment and a stage were loaded onto Radio Baha'i vehicles and transported to the *campo*, where local groups performed in front of members of their own community. Six such festivals were held, with a total attendance exceeding 3,500. Twelve groups were selected to perform in the finale, held in Otavalo. It was attended by more than 7,000 people, the great majority of them *campesinos* from the rural villages. "Nucanchic Tono" has become one of the largest festivals of indigenous music in all of South America.

Additional steps have been taken by Radio Baha'i to promote indigenous music. Each of

The group Inca Llacta (Land of the Incas), winners of the Fourth Annual festival of indigenous music, Nucanchic Tono (Our Music), sponsored by Radio Baha'i, Otavalo, Ecuador. The group, which formed in 1978 to compete in the first festival, now tours professionally throughout the Andean region and has made several recordings.

On File at ERIC

Recent entries in the ERIC (Educational Resources Information Center) files reviewed in this column are concerned with computerized information services, computer applications in information dissemination, educational uses of mass media, the economic analysis of educational media use, and media material development and exchange. All are available on microfiche and two in paper copy from the ERIC Document Reproduction Service (EDRS), P.O. Box 190, Arlington, Virginia 22210, U.S.A. Be sure to include the ED number.

● Hummel, Eckart. *Computer Communications and New Services. CCITT Achievements.* 1980. 18pp. (ED 228 999)

New non-voice services (sometimes also called information services) and the possibilities of telecommunication networks to support them are described in this state-of-the-art review. It begins with a summary of the various data transmission techniques, which include several types of data transmission over the telephone network: general, telegraph multiplexers, data multiplexers, modems for leased circuit applications, and modems for the switched telephone network. Tables are used to list specific equipment and provide additional technical details. The second section covers data transmission over public data networks and discusses user classes of service (start-stop, synchronous, and packet-operating mode of the terminal), user facilities, and data communication policy. Necessary characteristics of text for communication service (Teletex) are outlined, and features of subscriber facsimile service and videotext service are discussed. This paper was presented at the Regional Seminar on Techniques for Transfer of Scientific and Technological Information in Latin America and the Caribbean which was held in Mexico City, June 11-15, 1979. Available from EDRS in microfiche only for 97¢.

● *Unesco Regional Meeting of Computer Centre Directors in Africa (Arusha, Tanzania, April 14-18, 1980). Final Report.* 1980. 116pp. (ED 227 820)

The main points on the agenda of this meeting attended by eight chief participants from seven Unesco member states in the African region and several observers were (1) presentations by participants on their experiences in the application of informatics (i.e., computer applications in information dissemination) in the region; (2) problems in education and training in informatics; (3) formal education and training in informatics; (4) advanced workshops for existing personnel and education of management and users; (5) computer procurement in the region; (6) hardware and software developments and the

establishment of research projects; (7) computer applications with particular relevance to the region; and (8) major issues in informatics in Africa. This report summarizes the planning and conduct of the meetings as well as reports on informatics programs and presentations by the participants, and presents 13 recommendations formulated by the participants. Extensive appended materials include the meeting agenda; addresses delivered at the inauguration ceremony; presentations made by participants (M.N.J. Lambert, Zambia; P.E. Chilambe, Malawi; O. Abass, Nigeria; P. E. Mugambi, Uganda; R.J.P. Scott, Kenya; William D.S. Magambo, Tanzania; and Signate Cheikh Oumar, Senegal); reports on Unesco's informatics program by E.A. Owolabi and the activities of the Organization of African Unity in informatics education by O. Abass; a working document prepared for the meeting; and a participant list. Available from EDRS in microfiche for 97¢ or in paper copy for $9.15.

● Courrier, Kathleen, Ed. *The Educational Use of Mass Media.* World Bank Staff Working Paper No. 491. 1981. 131 pp. (ED 229 002)

This seven-chapter volume presents eleven papers dealing with the issues commonly encountered by educators and decision-makers in less developed countries when they consider the use of mass media to further their country's education and development. Individual topics and their authors are (1) "Marshalling, Managing, and Evaluating the Mass Media for Education and Development," by Shigenari Futagami; (2) "Do Audiovisual Media Possess Unique Teaching Capabilities?" by Janet Jenkins; (3) "The History of Nation-Building and the Future of Local Broadcasting," by Shigenari Futagami; (4) "Networking and Local Broadcasting: A Choice?" by Gloria Feliciano; (5) "Local Broadcasting and Community Media," by Alan Hancock; (6) "Can Mass Media Be Effective in Curriculum Improvement?" by Takashi Sakamoto; (7) "How Can Radio Be Usefully Applied to Education and Development?" by Hilary Perraton; (8) "Choosing Instructional Languages for Educational Radio Broadcasts in Less Developed Countries," by Wallace Lambert and Nelly Sidoti; (9) "What Does Educational Television Offer Us Now?" by Albert Horley; (10) "Photovoltaic Power for Communications," by Gerald Hein; and (11) "Selecting Appropriate Media," by John Tiffin. Available from the World Bank, 1818 H St., NW, Washington, DC 20433 for $5.00, or from EDRS in microfiche only for 97¢.

● Wagner, Leslie. *The Economics of Educational Media.* 1982. 169 pp. (ED 227 833)

This guide to the economic analysis of

media use in education reviews the evidence on the costs and benefits of educational media and provides a methodology for future decision-making. It includes chapters on establishing a framework for media choice, evaluating the effectiveness of media use, and analyzing costs. The empirical evidence from past projects is used to illustrate both different types of media projects and different methodological approaches. Among the projects discussed are the Open University in Great Britain, the Telesecundaria project in Mexico, the Nicaraguan Radio Mathematics Project, State University Resources for Graduate Education (SURGE) at Colorado State University, and the PLATO computer-assisted learning project in the United States. The final chapter draws on the evidence of past projects to discuss why many media innovations seem to fail and what is required to make such innovations more effective, thus turning their potential cost and educational benefits into reality. Notes, a five-page reference list, and a topic index are included. Available from St. Martin's Press, Inc., 175 Fifth Ave., New York, NY 10010 (price not given), or from EDRS in microfiche only for 97¢.

● Laborde, Ilia M. and others, Eds. *International Leadership in Educational Technology. 1980 Summary Report.* 1980. 116pp. (ED 230 173)

This compilation of working papers of the Southeastern Regional Media Leadership Conference held in San Juan, Puerto Rico, in March 1980, covers the general session, small group activities, and on-site visits. The objectives of the conference were to define alternatives for systematic curriculum development, provide for the interchange of experiences in determining needs and instructional specifications for material production, and develop a plan for an exchange of media materials and expertise. Preliminary pages list committee members, officers, and conference participants. The main body of the report includes (1) a paper by Hugo F. Sandoval, entitled "Leadership in Educational Technology in Latin America;" (2) the narration for a multiscreen slide presentation entitled "Education and the Collective Goals of a People," which focuses on Puerto Rico; (3) an overview of the Puerto Rico State University system; (4) reports from committees on curriculum innovations, media production, open learning, and Personalized System Instruction; (5) the conference evaluation report; and (6) general comments on the conference. Available from EDRS in microfiche for 97¢ or in paper copy for $9.15.   ■

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the rural festivals was recorded by station staff. These recordings were later edited and incorporated into the station's regular programming. In addition, the finale was broadcast live over Radio Baha'i. Each year, Radio Baha'i arranges to take the winning group to Quito, where they are given the opportunity to perform on national television.

Evidence of the increasing popularity of the music can be found in several places. As witnessed by the increase in festival participants, many more music groups are performing in the Otavalo region. Several of the groups that were formed in response to the festival have turned professional and have made recordings. Music store owners in the Otavalo region report increased sales of both albums and traditional instruments. Perhaps most telling, many radio stations in Ecuador have increased the amount of air time they devote to indigenous music.

"The festival, originally scheduled for one hour, lasted more than 12 hours."

The broadcasting model developed by the Baha'i community of Ecuador has proved so successful that it is now being replicated in several other countries. Radio Baha'i del Lago Titicaca, in Puno, Peru, initiated broadcasting in November of 1981. The response of the Quichua and Aymara people of the region was so positive that 30 music groups and more than 3,000 *campesinos* were in attendance at that station's inaugural festival. The festival, originally scheduled for one hour's duration, lasted more than 12 hours. Additional stations are being developed to serve *campesinos* in Oruro, Bolivia, and Temuco, Chile.

Perhaps the greatest indicator of the model's success is that, contrary to the typical diffusion pattern of communication models from North to South, the Radio Baha'i model, developed in rural Ecuador, is now being adapted to a recently constructed station in rural South Carolina, in the United States. ∎

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IEC Planning: Eight State-of-the-Art Principles

by John Middleton

While this article specifically addresses IEC projects for family planning, it should be noted that Dr. Middleton's points are equally applicable across sectors, and can serve as a useful planning guide for many kinds of projects devoted to social and economic development.

The central importance of effective information, education, and communication (IEC) as an integral part of population and family planning programs has been recognized since the beginning of the worldwide effort to integrate population and family planning programs into national social and economic development. In the past 20 years, considerable experience and research has been accumulated on the ways in which IEC programs can be effectively designed, implemented, and evaluated. Perhaps more effort has been devoted to population and family planning IEC than to any other sectoral program of development communication.

As the term "information, education, and communication" suggests, the potential scope of a national IEC program is broad. The range of media and program designs which have been brought to bear on population/family planning programs is vast, ranging from small items (such as matchbook covers) to establish symbol recognition, to a long-running television social drama designed to change strongly held values and establish new patterns of behavior. Interpersonal communication components have been established through home visitors, adult literacy classes, village organizations, labor unions, political organizations, and education programs in health clinics. Mass and interpersonal communications have been coordinated in a variety of ways.

A number of principles have emerged from this experience which, taken together, define the state-of-the-art in the field. While these principles are not immutable rules which apply equally in all program contexts, they do provide a framework of experience which can guide the development of comprehensive IEC programs.

1. Policy and Resource Assessment

The nature of the national policy base for population and family planning programs will determine the goals and approaches of the IEC program. Strong policies of limitation on population growth lead to equally strong, pervasive IEC efforts designed to directly affect contraceptive behavior. Policies based on concerns for mother and child alone lead to programs of a more educational na-

ture. Policies which emphasize the right of individuals to make informed choices, without explicit goals regarding either population growth or family health, lead to yet other kinds of IEC efforts.

Assessment of existing policy is an essential part of the design of an effective IEC program. Policies establish the rationale and boundaries for action. Resources make action possible. While the population/family planning organization can—and often should—lobby for policy change, the current program must be based on the existing policy. An essential component of preplanning assessment is an analysis of the resources available for planning. Of equal importance are the organizational resources which are, or could be, available to carry out the IEC program. An assessment of organizational capability, including the mass media system, should be an integral part of strategic planning.

2. Audience Analysis

One of the principal reasons for the importance of policy assessment is the fact that, in one way or another, IEC programs, like all development communication, are intended to change behaviors. The degree to which the behaviors in question are closely held and difficult to change does much to determine the way in which IEC programs are designed and carried out.

Population and family planning programs are concerned with some of the most intimate human behavior. Hence structured and sensitive audience analysis has become an integral part of the design of IEC programs. The practice of contraception takes place in the matrix of behaviors and values associated with children, family life, male/female roles, individual health and sexuality. Religious and cultural values are especially strong in these areas. Open discussion of these subjects is often very difficult.

All successful IEC programs rely on careful analysis of these behaviors, and the knowledge, values, and attitudes which shape them. The policy base determines how, how far, in what form, and on what schedule the IEC program can seek to change behavior in the direction of desired goals. Experience has shown that, over time, careful planning can lead to significant changes in society in these intimate areas of behavior. Experience also shows that success depends on clear understanding of the behaviors themselves and the social/cultural/political context in which they occur and change.

3. Strategy Design

Knowledge of population/family planning-related behavior, and associated knowledge, values, and attitudes, is the essential basis for action. This must, however, be combined with an understanding of how people learn and change, knowledge of how information of various kinds can be used to stimulate learning and change, and insight into the ways in which various communication media and channels can be used—singly or in combination—to achieve desired goals.

This is the process of designing communication strategy. It requires clearly stated objectives. Principles of human learning are used to structure information appropriately, whether in the form of simple mass media messages or family life education curricula and learning materials. The use of multiple channels, with consistent and reinforcing messages disseminated in predetermined sequences, has become a model for most programs.

4. Message Research and Pretesting

Experience has also shown that while analysis is a prerequisite to effectiveness, it is rarely sufficient. Message research and pretesting have become integral components of the strategy design process. Small-scale research on specific behaviors and objectives is needed to establish the basis for message design. Prototype messages must in turn be tested with representatives of the intended audience to establish their effectiveness and acceptability.

5. Participation and Feedback

Message research and pretesting are, fundamentally, a structured and quasi-scientific means of involving audiences in the process of program design. Audience participation and feedback in remaining phases of program development and implementation are equally important. It is only through direct and continuing interaction with program clients that planners and administrators can tell if their programs are providing clients with the appropriate information at the right time.

This is especially true for family planning, where there is continuing risk of loss of credibility through information perceived as inaccurate, or culturally inappropriate. In a more concrete sense, administrators must know if the information is being received and understood.

6. Management

It may be that as many programs fail in implementation as in analysis and design. A national IEC program, regardless of the implementing organizational structure, is woven out of a complex set of planning, design, production, utilization, monitoring, and evaluation activities. Large programs combine vari-

ous mass media with a range of interpersonal channels. Almost invariably more than one organization is involved, leading to complex problems of interorganizational coordination. Resources—human, fiscal, and technological—must be acquired, used effectively, and accounted for. This is an extremely challenging management task, one that requires a specific combination of planning, flexibility, and creativity.

> "Taken together, these eight principles can become the fundamental IEC building blocks. . ."

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7. Evaluation

Mechanisms for message research and pretesting and for participation and feedback go a long way toward building evaluation into the program. More, however, is needed. An organized management information system is needed to enable program administrators to anticipate, identify, and solve problems—and to spot opportunities. An effective management information system is essential to monitoring program outputs. Finally, evaluation of program effects—identification of the degree of change toward stated objectives—is essential to longer-term assessment of the underlying strategy and the identification both of needed corrections and new directions for the future.

8. Collaboration

The nature of population/family planning IEC is such that a large number of key individuals and organizations will have a stake in the way the program is designed and carried out. These "stakeholders" can be sources of support, or of opposition, depending upon the degree to which the program meets their expectations and needs. Collaboration with, and involvement of, stakeholders in the design and implementation of a national IEC program does not guarantee support, but it does significantly raise the probability that support, and not opposition, will be forthcoming. Moreover, the information and insight that stakeholders bring to the design and implementation process will be valuable. No IEC director, no matter how large and expert his or her staff, can be fully aware of the many variables which affect the success of the program.

Taken together, these eight principles can become the fundamental building blocks of an effective population/family planning IEC program. ∎

John Middleton is Vice-President for Academic Affairs and Director of the School for International Training of the Experiment in International Living in Brattleboro, Vermont, USA. From 1980-1983, he was a member of the staff of the Academy for Educational Development, first in Indonesia and then in Washington, D.C.

NFE Center Publications to Note

by Judy Brace

There are always so many good things issuing from the Non-Formal Education (NFE) Information Center at Michigan State University that any reader with a particular interest in education should be in close contact with the Center. Their program is "designed to facilitate an exchange of ideas and project information on development and non-formal education."

Among the most interesting of their recent publications is a 43-page annotated bibliography on *Non-Formal Education and Radio* (#14). This bibliography includes both theoretical materials and case studies, and although many of the publications may be out of print, there are enough references here to build a very useful and timely library on radio education.

An annotated bibliography on *Non-Formal Education and Agriculture* (#10) has also been recently published by the NFE Information Center. The scope of the study extends to food production, distribution, and consumption, and the role of education in these areas. Issues in agriculture, research, and environmental relationships are covered in separate sections, and sections are devoted to periodicals and to organizations in the field.

Other useful recent bibliographics include *Journals and Newsletters on Non-Formal Education and Development* (#12), and *Evaluation in Non-Formal Education* (#13).

Because Spanish language materials are generally scattered throughout collections on development subjects, it is gratifying to find that the NFE Center has gathered its own materials in Spanish into a publication that lists these materials in such nonformal education subject areas as agriculture, appropriate technology, communication, community development, evaluation, nutrition, women in development, and others. Our Latin American readers will find *Spanish Language Materials in the NFE Library* a wonderful resource.

The NFE Information Center has begun a new Manual Series with two excellent guides to resource center management. Manual Series #1, *A Simple Guide to Managing a Resource Center on Non-Formal Education for Development*, is not only what its name implies, but more. Everything here is transferable to the management of a resource center in any other subject area because it is the *process* of organizing that is so valuable and so clearly defined in this publication. The

A Communicator's Checklist

1 *Report of the Regional Workshop on the Role of Mini- and Microcomputers as Tools for Economic and Social Development.* (Economic and Social Commission for Asia and the Pacific, 1982), 27 pp.

The mutual support and participation of international organizations or other outside parties in assisting countries as they grapple with problems of automating in the information age is appropriate and desirable, especially where it facilitates technical cooperation and the sharing of ideas and experiences between nations. A valuable example comes to us from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Through its program on Government Information Systems, ESCAP has drawn the attention of its member governments to the need for the systematic organization and coordination of information in the public sector. Agriculture, industry, trade, and population are fields in which such information is critical for development.

Computer Organization Meeting

Because such applications are growing, member governments of ESCAP have increasingly turned to computerization of these functions. However, ESCAP felt that the need to organize the nature and priority of computerized information systems had not been sufficiently recognized. Thus, ESCAP sponsored a series of meetings on the subject of information systems and data processing. One such meeting was devoted to the organization and management of mini- and microcomputers in the context of government information systems policy. The report of this meeting is abstracted here.

The Regional Workshop on the Role of Mini- and Microcomputers as Tools for Economic and Social Development organized by the United Nations Economic and Social Commission for Asia and the Pacific met in Bangkok, November 8-16, 1982. Participants from Bangladesh, Burma, Denmark, India, Indonesia, Japan, Malaysia, Pakistan, the Philippines, Sweden, Sri Lanka, and Thailand; and representatives from the Asia Institute of Technology, the UN Department of Technical Cooperation for Development, the UN Industrial Development Organization, the UN Development Programme, UNESCO, and the World Health Organization attended. The Workshop examined the technological aspects of using small computers and

related technical policy issues important in using small computers for managing information. The Workshop was an outgrowth of the Intergovernmental Meeting on Government Information Systems and Data Processing organized by ESCAP in 1981 which had emphasized the crucial need for integrated and coordinated management of information systems in government and their importance for carrying out programs for socio-economic development.

The mini- and microcomputer experiences and knowledge of the governments of ESCAP countries were exchanged on the following topics: (1) use of mini and microcomputers (2) support services (3) training (4) software (5) management (6) technical transfer and (7) policy. The growth pattern for microcomputers was noted to be much higher than the rate of growth of mainframes and minis over the past two years, which was attributed to the continuing decline in the cost of that computer technology and a growing awareness of the benefits of harnessing computing power. Growth, however, had been primarily in the private sector. Virtually all governments were considering the introduction of micros into public sector activities.

Issues of maintenance, repair services, and compatibility in data transfer were cited as problems all faced by member countries. Policies of individual governments on the use of minis and micros were examined, and it was observed that decisive action to set up mechanisms for establishing policy guidelines had yet to be taken, though some countries, such as Malaysia and Pakistan, had undertaken studies.

Software issues also were a major topic of concern noted at the Workshop. Quality, sophistication, cost, and selection of software; the number and variance of microcomputer operating systems; standards for high-level computer languages; and data and program transfer also were acknowledged as problems faced by member countries.

After reviewing the experiences of the member countries and carefully evaluating the technological trends and future prospects for small computer systems, the Workshop made the following recommendations to the member governments:

(1) that a high level national body within each country be formed to coordinate government information systems;
(2) that each government establish an appro-

priate mechanism to monitor new products, services, and *de facto* industry standards in order to keep abreast of technological developments;
(3) that standards for software, hardware, and data structures be established in order to facilitate exchange of data and software at national and regional levels;
(4) that modular and portable systems be developed to overcome the problem of obsolescence;
(5) that training programs be established for developing skilled manpower;
(6) that facilities be established for in-house development of software for government applications;
(7) that facilities be established for an uninterrupted and regulated power supply.

The Workshop strongly recommended that ESCAP play an important and central role in assisting member countries' use of mini- and microcomputer systems by providing a base for technical assistance. The Workshop suggested participants needed guidelines for coordinating government procurements for the development of an indigenous computer industry; for professional expertise in the computer field available in member countries; and for maintenance, standardization, and training. Other recommendations for ESCAP included:

(1) that workshops on specific issues and for periodic reviews of country experiences be established;
(2) that a working group on information systems in ESCAP be established for in-depth study of problems encountered in the development of information systems;
(3) that periodic reviews on standards in member countries be held; and
(4) that ESCAP should serve as a regional clearinghouse for the transfer of microcomputer technology for government applications. ■

Copies of the full report on the ESCAP meetings are available from ESCAP, United Nations Building, Rajadamnern Avenue, Bangkok 2, Thailand.

2 *Health Education by Television and Radio: Contributions to an International Conference, with a Selected Bibliography,* edited by Manfred Meyer, Internationales Zentralinstitut für das Jugend-und Bildungsfernsehen (München, K.G. Saur, 1981, 476 pp.)

A very useful publication for field practitioners and academics alike, this 1981 collection of contributions to an international conference by the same name brings together a wide variety of opinions, case studies, and research findings. Unlike many conference publications, it is skillfully edited, well organized, and helps the reader find areas of particular interest. There are major sections on broad thematic issues, and others which report basic research findings. The bulk of the publication, however, focuses on case studies of countries as different as Tanzania, Bavaria, and Hungary.

The subject is health communications, and the book pretty well sticks to that area. But there is such a range of health communication experience reported that anyone interested in communication, particularly development communication, will find something useful. A wide selection of landmark projects are reported: ACPO's health programming, the Xerox-sponsored "Health Minutes," the Stanford Heart Disease Prevention Campaign, and many others. I was particularly struck by some interactive quiz and test experiments in the Federal Republic of Germany. The program directors, in an effort to attract wider media attention, transformed a basic first aid course into a televised First Aid Quiz. The author concludes that the Quiz format "achieved greater attention than conservative education measures because it allowed fewer distractions . . . and widened the broad effect of health education measures because its entertaining form provided greater incentive to join in. . . . In addition, poor scores brought out gaps in knowledge which motivated people to acquire more information."

Most of the articles are substantial enough to be useful. They provoke thought, and even though many are dated, few of the recommendations they suggest are actually being put into practice. So there is plenty to learn even from ten-year-old programs. There is a good bibliography and a subject index, which is rare in this type of publication. ∎

Available from International Zentralinstitut für das Jugend-und Bildungsfernsehen, Bayerischer Rundfunk. Postfach 20 05 08 8000, München 2, Federal Republic of Germany, for US$17.50 plus $1.50 postage, or for DM 42.

Reviewed by Bill Smith, a Senior Vice President of the Academy for Educational Development. He has done extensive work in health messages and the mass media.

3 *Diffusion of Innovations* (Third Edition) by Everett M. Rogers (New York, New York: The Free Press, 1983), 453 pp.

Everett Rogers has again done it. The third edition of his internationally known book is an excellent revision and expansion of his previous work in the area of the diffusion of innovations. The third edition is about 50 percent new. It incorporates answers to most criticisms raised against the "classical" diffusion model, although many readers may speculate that the new book dissolves instead of resolving current concerns regarding the role of communication in social change processes, i.e., by placing a new dress over an old body.

The third edition contains 11 chapters: 1. Elements of diffusion; 2. A history of diffusion research; 3. Contributions and criticisms of diffusion research; 4. The generation of innovations; 5. The innovation-decision process; 6. Attributes of innovations and their rate of adoption; 7. Innovativeness and adopter categories; 8. Opinion leadership and diffusion networks; 9. The change agent; 10. Innovation in organizations; and 11. Consequences of innovations.

Chapters 3, 4, 8, 10, and 11, are particularly innovative, although many of the other chapters offer a fresh perspective, incorporating among other factors: a view of communication as a convergence process; a view of diffusion and innovation as an uncertainty reduction process via information and influence; the consideration of communication networks as key structural factors in diffusion; an emphasis on process as opposed to variance research; an emphasis on equity as opposed to the assumed "trickle-down" perspective; an emphasis on pursuing the line of highest resistance in diffusion programs; and, a strong consideration of the consequences of the adoption of innovations.

Chapter 3 is a careful evaluation of what the diffusion perspective has contributed, and the ways in which it has failed, e.g., a pro-innovation bias, an individual blame bias, a lack of consideration of equality.

Chapter 4 introduces a fresh perspective on the "innovation development process," and argues that reinvention often occurs as units adopt innovations.

Chapter 8 provides the reader with a basic conceptual scheme for understanding the logic of communication networks, the roles that units occupy in networks, and the metrics which aid in the prediction of innovativeness.

Chapter 10 considers innovation in organizations as a two-stage process involving initiation and implementation. Initiation is said to consist of agenda setting and symbolic matching. If matching leads to adoption, then implementation consists of redefining, clarifying, and routinizing.

Chapter 11 introduces the concept of "communication effects gaps," and deals with strategies for attempting to raise the level of good in society while at the same time reducing inequality.

The definition of development which permeates the text is: "a widely participatory process of social change in a society, intended to bring about social and material advancement (including greater equality, freedom, and other valued qualities) for the majority of the people through their gaining greater control over their environment."

Practitioners in the field of development communication will certainly benefit from reading this third edition, not only because it includes new concepts, but also because it offers needed tools for change programs which at their core are concerned with equality and participation. ∎

Available from The Free Press, McMillan Publishing Co., Front and Brown Streets, Riverside, N.J. 08075, for US$18.95.

Reviewed by Felipe Korzenny, Associate Professor of Communication at Michigan State University.

Keeping Current

• Now in its fourth edition, the *International Yearbook of Educational and Instructional Technology 1982/1983* continues its practice of providing an overview of the current state of educational technology throughout the world. The first two sections of the yearbook include a compendium of selected readings on developments and trends taking place in the field on topics such as technology transfer and the educational potential of PRESTEL, a national videotext system in Britain. Section 3 is new to this edition in that it pulls together information on resources of educational technology which was scattered in previous yearbooks. Here a bibliography, journals, conferences, and consultants in the field are listed. The fourth section provides a current directory, by country, of universities and other institutions and associations concerned with educational technology. Section 5 lists producers and distributors of software in the UK and US, while Section 6 provides lists of producers of AV hardware marketed in the UK and US. While the yearbook exhibits a UK/US bias, it still will be extremely useful to practitioners in all nations interested in educational technology and programmed learning.

Available for US$37.50 from Nichols Publishing Company, 155 West 72nd Street, NY 10023, USA. Also available in Great Britain from Kogan Page Ltd., 120 Pentonville Road, London N1 9JN, U.K.

genre and dialect distribution, level of difficulty, and theme. Texts with elements related to themes commonly explored in the experimental classrooms and those with the sorts of courageous characters children find captivating were favored. Staff from INDRAP, the Adult Literacy Service, and graduate students at the School of Education did the required selection and prepared the texts for typing.

Two factors contributed significantly to the impressive success of the seminar workshops. First, all texts reviewed had been pre-edited and duplicated. Participants thus had concrete materials to evaluate and embellish. According to preference, the task could either be done by an individual and then collectively reviewed, or by the entire work group straight away.

Modifications and Additions

The texts were modified in several ways. They were further adapted from an oral to a written medium by eliminating excessive repetitions, or by filling in plot elements a performer had eliminated. At the same time, their tendency toward repetition, characteristic of oral art forms, was useful for early readers needing a controlled, recurring vocabulary. Vocabulary choices were sometimes altered, or more often, annotated to increase students' command of dialectical variations. Questionnaires were created to include exercises in vocabulary, reading comprehension, and elementary grammar. Tongue twisters, riddles, and proverbs were added at the end of the longer texts adapted from folktales, descriptions of a traditional craft, or stories of community life and history. These shorter forms were seen as a means of encouraging an appreciation for figurative language. Specific illustrations were recommended.

The second factor important to the seminar's success as an innovative step for future textbook production was the participation of all Nigerien institutions working on the development of national language materials. No single institution is likely to have enough trained personnel to collect materials, so cooperation and institutional linkages are necessary not only for the production of quality texts, but also to assure their distribution and acceptance by the greatest potential audience.

Linguists, teachers from the experimental schools, the University, the Adult Literacy Service, and the regional OAU (Organization of African Unity) all made their contributions. Spellings were further standardized. University and administrative personnel improved their grasp of teachers' needs and capabilities, and teachers profited from this in-service training. The cooperative atmosphere nurtured a mounting esprit de corps.

Groups worked long hours, sometimes even on Sunday. At the end of the two-week seminar, nearly all the books were ready for final typing and offset printing.

Local artists were contracted to draw the prescribed illustrations. Their village backgrounds were especially relevant to texts adapted from oral traditions, since clothing, hairstyles, housing, and other illustrated objects vary from one language group to another. Illustrations were needed that would appear realistic to children for teachers to use in lessons about culture.

Focus on Reducing Typos

Establishing proofreading groups was a final innovation. Prior publications in national languages had been criticized for excessive typographical and spelling errors. Recognizing that our clerical staff was largely undertrained, and that no individual was likely to catch all errors, we recommended that three people independently proofread each text before it went to press. As a result, typographical errors were greatly reduced.

The project's final stage will be an evaluation of the books to be coordinated by INDRAP. The Institute does not have its own evaluation unit, but recognizes that evaluation skills will become increasingly important as more materials are produced. Once again, we hope to strengthen collective resources through collaboration, this time with the evaluation offices of the Adult Literacy Service and the School of Education. The evaluation instrument will be tested in a limited number of classrooms during the fall of 1983, and more widely tested during the latter half of the school year. Evaluation issues include how communities have responded to the books, how appropriate their level of difficulty is, how well the spellings convey differences in dialects, and how teachers' training levels affect their use of the books.

Training Sessions Essential

Book production prompted another training effort in July 1983. The need to strengthen teachers' grammar skills in national languages became particularly evident when questionnaires were being appended to the reading texts. Therefore, INDRAP coordinated two weeks of in-service training for teachers and their local education advisors. The two weeks were only enough to lay the groundwork for writing grammars, for defining a classroom curriculum, and for standardizing the required terminology. However, the training prompted INDRAP to schedule follow-up activities for the current school year. This work, in turn, will suggest improvements to be made in future reading books.

Overall, the project design has functioned very well. In the process of producing the first series of Nigerien textbooks, the values and aesthetics of several cultures' oral art forms have been transformed into written

form for classroom use, teachers and others have increased their national language skills, and a system that profits from the cooperative efforts of sister institutions has been developed.

One step might well be added to the process. After the texts have been edited and illustrated, but prior to their final publication, they could be duplicated with electronic stencils to permit trial use in several classrooms, and, if appropriate, further revision. While formative evaluation would require more time than our Accelerated Impact Project structure initially permitted, it could improve the match between student skill levels and textbook difficulty as it strengthened the evaluation expertise of textbook producers.

Both project participants and observers have occasionally questioned why INDRAP produced readers before lower level pre-primers were available. In some sense this is a logical criticism. However, as we began the book production process, we realized that pre-primers are actually more complex to write than higher level readers. The progressive introduction of sounds, words, and grammatical structures should be much more rigorously controlled. Pre-primers are now slated for future production, however, partially as an outgrowth of the production experience INDRAP has gained to date. Math books, grammars, and social studies books adapted from texts teachers have composed themselves are also planned. The new reading books produced thus far for the primary grades, with stories drawn from Niger's rich and varied oral tradition, mark an appropriate and memorable entry into Nigerien textbook production. ▪

Connie Stephens is the technical assistant on the NIGER/USAID Maternal Languages Text Preparation Project being implemented at INDRAP. Further information about the project can be obtained by writing to her or to George Corinaldi, Human Resources Development Officer, c/o Niamey-USAID, Department of State, Washington D.C. 20520, USA.

Two Thoughts on the Use of Microcomputers in Developing Countries

by Kurt Moses

In those countries in which microcomputer introductions have not been successful, or those in which future attempts to introduce computers of any sort will be unsuccessful, two cardinal considerations have usually been overlooked. These considerations are simple to state; but in the heat of proposals and in the press of day-to-day business, they are frequently forgotten:

1. Is the country or Ministry concerned because the volume of work has increased dramatically in recent times?
2. Is the country or Ministry concerned about the quality of its work?

Lacking an affirmative answer to either of these questions, introduction of any kind of automation device is fraught with peril.

In the developed world and in some less developed countries, computers have been most easily introduced where the volume of work has increased substantially in a fairly short period of time and where the opportunities to increase the size of staff, be it clerical, managerial, or instructional, have not risen as rapidly. Lacking this, computers appear to threaten the current employment of many persons and on a countrywide basis may reduce the opportunities for employment in traditional industries. As a result, unless the volume of work is increasing rapidly in excess of trained manpower's ability to handle it, computers may be seen as a negative factor. Numerous instances of this negative perception of computers' competing for jobs are beginning to appear in the world press.

The second major reason to introduce computers or automation is to improve quality. Quality may be perceived in terms of quality of instruction, as it often is in the United States at present, or it may be seen as quality of service. This frequently means improvement in the service industry such as airlines, hotels, or travel agencies, the improvement being in speed of service as well as its basic accuracy. A lack of concern for quality of service itself does not bode well for the introduction of automation and the attendant problems and crises which occur during the transition phases. Computers themselves cannot overcome a lack of concern for quality either in terms of follow-through, conscientiousness, or support of information to the computer. While new techniques have been developed to reduce the chance for random errors, a systematic lack of concern for qual-

ity will almost invariably bring a system down.

Project managers and technical staff who are considering introducing computers need to consider these two cardinal questions. The wrong answers to them could well have a dramatic impact on the success or failure of computerization. ∎

Kurt Moses is Director of The Academy for Educational Development's Systems Services Division. He has been dealing with automation worldwide for ten years.

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guide takes the reader through the concept of classification, the way in which documents are processed, cards prepared and stored, and how, once this is done, a document is located. It is well understood in the information field that until a manual system is well thought through, tested, and corrected, it should not be transferred to an electronic system. Any resource center that has organized its materials in the manner illustrated in this guide would be able to convert to an electronic version with relative ease should the occasion arise. However, as the quality of the bibliographies that come from the Center attests, this is an effective and appropriate manual system that should satisfy the needs of almost any information center.

The second in the Manual Series is a guide to *Preparing Citations and Annotations*. These instructions are particularly useful for compiling bibliographies, and ensure a standardized format that will include all pertinent information about any publication (title, author, publisher and address, date, number of pages, etc.). This guide will be frequently consulted by anyone wishing to find clear, easy steps to a professional bibliographic product.

Another series of publications from the NFE Center is their Occasional Papers. A recent title is *Training Popular Theater Trainers: A Case Study of Nigeria* (#10).

Information on these publications is available from the Non-Formal Education Information Center, 237 Erickson Hall, Michigan State University, East Lansing, Michigan 48824, USA. ∎

Judy Brace is Resource Center Manager and Director of the Clearinghouse on Development Communication.

NOTICE

Over the past year, some people have ordered materials from us without including their name and address. There have been cases where a check or money order was included without any indication of who the person ordering was. Please check your orders to see if they have been filled. Write to us if there are outstanding orders. You may be one of the anonymous orderers.

Numeracy Project Makes New Use of Pocket Calculators

by Mary Dickie

For the majority of Papua New Guineans who live in rural areas (some 85 percent of the population) and who still follow a more or less traditional way of life, the 700 different languages and 250 counting systems present no real problem—as long as they stay in their own villages. But as soon as they step beyond village boundaries, people need to be able to communicate with others and to deal with the changing social and economic environment. Most people in accessible areas do learn and use one of the official languages (English, Pidgin, or Motu) but few have yet come to grips with international counting and measuring systems to enable them to deal with money and numbers.

In the village setting, the requirement for using "western" numbers might seem very basic—as simple as putting a price on the scones baked in a drum oven; but if you cannot add together the price of ingredients and fuel and divide by the number of scones made, you could easily sell them at a loss. And many people do. If you have a small commercial, industrial, or agricultural project, you need greater number skills than that—for working out materials estimates, overheads, prices, stocktaking, bank accounts, etc. And yet the kind of basic arithmetic involved is often beyond the skills of a university student, so for those who have had little or no formal education, these problems seem almost insurmountable. However, 1980 saw the introduction of the liquid crystal display calculator—a remarkably cheap hand-held calculator, with an estimated battery life of some 10,000 hours. This new technology provided a tool which could be used in a village for a very long time, provided that people could learn how to use it to solve their number problems.

So during the last two years, the Department of Commerce in Papua New Guinea has been trying to find out what sorts of problems people encounter with numbers in their daily lives, and to discover a means of teaching people to tackle these for themselves, without the help of an extension officer, by using a calculator.

The range of problems we uncovered was very wide—a man who could not re-roof the community hall because he could not work out how many sheets of iron he should buy; a woman who made tapioc parcels to sell at the market and ended up with less money than

• Another yearbook, but of a more theoretical and less practical nature, is the *Mass Communication Review Yearbook* for 1983. Thirty-eight articles, most of them reprinted from other sources, are drawn together in one volume on a variety of topics ranging from Feminism and the Media to New Technology and the Information Age. The yearbook is available for US $32.00 from Sage Publications Inc., 275 South Beverly Drive, Beverly Hills, California 90212, USA.

• The Commonwealth Bureau of Agriculture Economics, part of the Commonwealth Agricultural Bureaux, publishes two abstract journals which are noteworthy. *Rural Extension, Education, and Training Abstracts (REETA)*, as the name implies, covers nearly all aspects of education for rural development, formal and nonformal education, and rural extension. Subject headings include Educational Radio, Audiovisual Aids, Communication, Mass Media, Diffusion of Information, Evaluation, Vocational Training, among hundreds of others. A sample abstract identified under the communication heading is entitled, "Communication methods to promote grass roots participation for an endogenous development process." Some 1,500 abstracts per year are drawn from over 2,000 serial publications.

• *Rural Development Abstracts (RDA)* covers the world literature on physical resources, human situation and resources, economic utilization of resources, public services, and projects and surveys as they apply to rural development, to produce over 2,500 abstracts per year. Both *REETA* and *RDA* have full author, subject, and geographic indexes. While international in terms of subjects and the literature they cover, the abstracts are in English. Subscriptions to each quarterly abstract are approximately US $89.00 per year, but currently a special introductory rate to new subscribers is being offered at US $57.85. The Bureau also offers a Photocopy Service to supply photocopies of items abstracted in their publications. Both publications are obtainable from CAB Central Sales, Farnham House, Farnham Royal, Slough SL2 3BN. U.K.

• The ERIC Clearinghouse on Information Resources has two recent publications in their Information Analysis Product series which readers may want to make note of. The first, *Information Technology in Education: The Best of ERIC*, by Donald P. Ely, highlights recent listings in the ERIC database which deal with emerging technologies, such as cable television, electronic mail, satellite communication, and teleconferencing, for the delivery of information in educational settings. (Computers or microcomputers are not included, as the literature

on these abounds elsewhere.) The second publication, *Sources of Information for Instructional Technology* by Ann L. Wiley, should help practitioners, students, faculty, and researchers in instructional technology locate information quickly and easily. Information services useful to instructional technologists are described, though the comprehensive bibliography of recent materials in the field of instructional technology comprises most of the publication. Both items are available from Information Resources Publications, 130 Huntington Hall, Syracuse University, Syracuse, New York 13210, USA. The prices are US $4.25 and US $4.50 respectively.

• Based on its experience of teaching people about distance education and running distance-teaching institutions, the International Extension College in Cambridge, England, has published three training manuals on writing, research, and administration. The third of these, *Administration of Distance-Teaching Institutions* compiled by Tony Dodds, is intended for people who need to know how to organize the activities of such an institution. In three parts, including a volume of case studies and a board game, the manual includes exercises and assignments on units such as choosing media, managing print, the use of broadcasts, student services, internal organization, costs, and budgeting. For those setting up a new college or trying to improve their organization's efficiency, this manual will be useful. The cost for readers in the industrialized world is £18 surface or £24 airmail; for those in developing countries it is £13 surface or £16 airmail. Orders should be directed to International Extension College, 18 Brooklands Avenue, Cambridge, CB2 2HN, U.K.

• Many readers will remember the First Quarter 1981 issue of *The Tribune* entitled *Women and Media* which discussed major issues relating to how women use the media. A second issue, *Women and Media #2*, has now been dedicated to this subject. In this Second Quarter 1983 issue of *The Tribune*, women's projects in different parts of the world are shown as examples of how issues affecting women have been tackled using media as a tool. Women's Regional Information Networks in Africa, Asia, the Pacific, Latin America, and the Caribbean are also discussed. *The Tribune* is published in English and Spanish. Subscriptions are free to women in developing nations. US$8.00 in North America and $10.00 elsewhere, from the International Women's Tribune Centre, 777 UN Plaza, New York, NY 10017, USA.

• We would like to call our readers' attention to a new publication, The National Council of Development in Karnal, India, has begun to publish *Interaction*. The inside

cover of Volume 1, No. 1, 1983 states *"Interaction* is a journal designed to integrate, juxtapose, and refocus the conceptual and empirical knowledge on developmental communication." To be published three times per year, the annual subscription is US $18.00 for surface mail. Order from Editor of Circulation, NCDC. Post Box 33, Karnal-132001. India.

• Finally, for our readers who want to keep up with communication materials in Spanish, there are three items to bring to your attention. The first is the Spanish edition of the International Women's Tribune Centre publication mentioned above. *La Mujer y los Medios de Comunicación #2*. This is full of resources and networking information. See above for the address.

• From Mexico's Centro de Integración de Medios de Comunicación Alternativa comes a new publication, *Cuadernos de Comunicación Alternativa*. They expect this new monograph series (to appear quarterly) to provide a forum for case studies and current thinking from Latin America in particular, and the Third World in general. This issue opens with an essay on the dilemma between creating a new alternative media structure or changing the existing structure to include alternative approaches. There are essays on technology transfer, Bolivian miners' radio, and workers' Super 8 cinema for nonformal education in Nicaragua. For information about the Centro and this new series, contact CIMCA, Apartado 20-617. Delegación A. Obregón, 01000 México. D.F., México.

• The January-June 1983 issue of *Chasqui*, from the Centro Internacional de Estudios Superiores de Comunicación para América Latina (CIESPAL), is devoted to the new communication technologies. With the exception of an article on satellites for social services, the articles focus on computer technologies. *Chasqui* has added some new features, including abstracts of the articles in Portuguese and English, and a very useful "News" section that identifies new books, articles, communication activities, conferences, etc. *Chasqui's* subscription rates are US $10.00 per year for Latin America; elsewhere, US $20.00. Write to CIESPAL, Apartado 584. Quito, Ecuador. ∎

By Judy Brace and Mary M. Kaufman

Notice: We Are Moving!

After March 15, the new address of the Clearinghouse will be:

Clearinghouse on Development
Communication
1255 23rd Street, N.W.
Suite 400
Washington, D.C. 20037. USA

which attempts to teach with the same degree of thoroughness.

Four Conclusions

It is dangerous to draw far-reaching conclusions from two studies, even when these are buttressed by findings from the literature more generally. But four conclusions seem legitimate.

The first is the most obvious: there are more ways of killing a cat than choking it with cream, and there is no single best way of using mass media to support agricultural extension. The evidence suggests that a variety of media, used in various different ways, can be effective in supporting agricultural extension, or in taking over some of its functions.

Second, mass media have been little used for training agricultural extension agents, as opposed to farmers. And yet in many countries, they have received little education and are dealing with an increasingly knowledgeable clientele of farmers. (In contrast, ministries of education have made considerable use of the media for inservice training of primary school teachers.) *INADES-formation* in Cameroon has done some training of extension agents. If the content of its courses can reach far larger numbers of farmers through an extension agent who is enrolled in them, then the benefit/cost ratio is likely to be much more favorable. We could envisage, for example, a radio series which was aimed at both farmers and extension agents, with a printed correspondence support aimed mainly at the agents.

Third, radio is a strikingly cheap and effective way of reaching farmers. We believe there is scope not so much to extend it as to improve it. If more resources went into the production of radio programs and into organizing feedback to guide producers, the programs would be better. And we believe that there is scope for more research on the kind and style of radio program which is most effective. We recognize that there are particular difficulties where there are marked local differences in the area covered by a radio transmitter. These may include differences of climate, soil, and language. Broadcasting also presents particular difficulties to *INADES-formation* as a non-government agency. The value of radio makes it worth struggling with those difficulties.

Finally, *INADES-formation's* philosophy—that farmers need education rather than instruction—determines the way it works, and stands in contrast to the working assumptions of most extension services, which see their role as providing information and instructions to farmers. In consequence there has often been a gulf between adult education and agricultural extension; the former has the theories while the latter has the manpower. *INADES-formation* shows that the gulf can be bridged, to the advantage

of both services, and to the benefit of peasant farmers for whom they exist. ∎

References

1. She had five sisters. One adopted the idea straight away; two followed a season later and the fourth, laggard, followed behind them. The fifth and cleverest said 'to discover whether this is worthwhile, we must calculate the inputs in terms of labor, camel dung and water, and only then make a decision'. Unfortunately she starved in a famine a few years later, and economics then had to wait a long time to be reborn.
2. See Chambers, R., *Managing rural development*, Uppsala: Scandinavian Institute of African Studies, 1974; and Benor, D., and Harrison, J.Q., *Agricultural extension: the training and visit system*, Washington: World Bank, 1977.
3. Perraton, H., *Mass media, basic education and agricultural extension* (Population and human resources division discussion paper, mimeo) Washington: World Bank, 1982.
4. Jenkins, J., and Perraton, H., *Training farmers by correspondence in Cameroon*, Cambridge: International Extension College, 1982, £2.40 surface mail,£3.20 air mail: and Perraton, H., Jamison, D., and Orivel, F., *Mass media for agricultural extension in Malawi*, Cambridge: International Extension College, 1982, £2.40 surface mail,£3.20 air mail.
5. See Warr, D., 'Evaluation media in Malawi' *Educational broadcasting international* 11 (3) for a fuller account of the research unit's work.
6. Jenkins and Perraton, op. cit., p.2.

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Public Education Program on Immunization

The Ministry of Health in Jamaica has launched a massive public education program to focus on a national plan of immunization involving children from 0-12 years old.

Scheduled to be completed by the end of 1983, it is a further development in the Ministry's existing Expanded Program of Immunization (EPI) and is expected to achieve an 80 percent immunization status for children in this age group.

Children in the target groups will be immunized against tetanus, polio, diphtheria, whooping cough, and measles.

The education program, which was preceded by a recently concluded survey on knowledge, attitudes, and practices in relation to immunization, is being funded by UNICEF and PAHO with grants of J$50,000 and J$40,000, respectively.

A local musician, singer Jimmy Cliff, has allowed his hit song "Treat the Youth Right" to be used as a jingle in the immunization program. The Graduate Theatre Company of the Jamaica School of Drama has also used drama to highlight the importance of immunization. *(Source: Jamaica Information Service)* ∎

Reprinted from CAJANUS, The Caribbean Food & Nutrition Institute Quarterly, *Vol. 16, No. 2, 1983.*

she started with, after she had sold them all; many tradestore keepers who could not give the right change from a *kina*; farmers who could not work out how many posts and how much wire to buy to fence their coffee blocks. The examples are endless. Collecting all of this information only served to emphasize the extent of the problem we were trying to deal with.

Following this, we have been experimenting with a whole variety of training methods and materials, with village and business groups and government extension workers in five Provinces. We have tried to teach people the basic and essential number skills they need for their own practical purposes, basing all our efforts on the use of a hand-held calculator as the means of learning and the means of solution.

During all this time, the project has focused on certain key facts:
* People in Papua New Guinea have very readily adapted to using new technologies in many spheres of everyday life, so learning the arithmetic they need with the help of a calculator could be appropriate, provided that the calculator itself would not run down.
* To be successful, basic skills training has to be directly related to practical tasks, and teaching has to be aimed at the problems which each individual or group has to deal with. Examples are understanding and using a calendar to calculate gestation periods for pigs or cattle, or adding costs and dividing by quantities produced, for a group making clothes or bread.
* New skills can be learned for new needs, without destroying or changing traditional ways. For example, many people learn Pidgin or English, but do not "forget" how to speak *ples tok*, so they could learn western arithmetic without abandoning their traditional counting systems.
* Developing new concepts is the most difficult problem in education, but learning a routine to deal with a specific task is not; so our training should be aimed at teaching people precisely what to do, when and how, which numbers to use to solve a problem, rather than attempting to achieve an overall understanding of arithmetic.

The project is now aiming to extend its work outside the "business only" boundaries which it has previously emphasized. Preliminary discussions with three major extension departments—Education, Primary Industry, and Community and Family Affairs—have been very encouraging and we hope to be working very closely with them and to produce materials appropriate to their areas of interest.

Further information about the project can be obtained from the Project Director, Allen Edwards, at Laloki College, P.O. Box 1864, Boroko, Papua New Guinea. ∎

(continued from page 3)

In a situation where instructional radio and TV are comparatively new, it would seem desirable to devote substantial effort to context and needs assessment, determination of goals and objectives, examination of audience characteristics, and consideration of the media combination to be used. These should come before the pretesting of materials and program attributes.

Work From a Broad Base. Assessment of educational needs should involve input from a representative range of people who know the real needs and nature of that society as well as the specific target audience. The value of responses from members of the intended user group, whatever it may be, should not be underestimated. An inventory of audience characteristics may be accomplished through the careful collection of data from a sample of individuals through personal interviews, careful field observation, or conventional testing. Final decisions as to priority of objectives and suitability of plans may in actuality need to be shared among those in charge of curriculum or development, program design and preparation, and others in the educational or political power structure. In any case the question of exactly what are to be the goals and objectives of a series of programs should be clearly understood and defined as an early step in any instructional design process.

Establish Commitment to a Research Approach. The cooperation of writers and producers is absolutely essential if formative evaluation is to do any good. Since the point of formative research is to show the way to the most effective shaping or improvement of a product, research activities should occur before or during the preparation of scripts. Planners, writers, and producers are then able to make their decisions after examination of collected data or special test results. The professional egos of writers, educators, and production specialists must become adjusted to the possibility that audience-derived data may overrule what they would otherwise do on the basis of prior experience or creative intuition. Matters will proceed much more smoothly if all concerned are deeply committed to the idea that programs should be constructed, not in accordance with familiar stereotypes, but in recognition of social realities and audience characteristics, needs, and interests.

Be Ready to Reshape the Project Schedule. Use of formative evaluation is likely to require a substantial revision of the usual project schedule. Without a formative research approach, preliminary discussions that occur before scripting may be relatively brief. Planners tend to engage in enthusiastic airing of personal convictions about needs and objectives and an exploration of basic points of decision. Everyone is eager to proceed. If formative evaluation is employed, however, some

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"It appears to be a safe general rule to allow more time for preparatory research than anyone expects. . ."

of the most important work may be directed toward an accurate determination of needs. An analysis of detailed audience characteristics may be needed before objectives are laid out and before content and methods are chosen. In other words, important research activities occur well before scripting is started. Other research procedures may be desirable before or during production. It appears to be a safe general rule to allow more time for preparatory research than anyone expects to be necessary.

Allow for Pilot Testing. Pilot testing of a trial production or of the first one or two programs in a series is probably the most conventional, though not always the most important, application of formative evaluation. Pilot testing determines the extent to which the specific objectives were achieved and exactly which material did or did not contribute to those ends. Such testing should be done before creative commitments become too strong or too complicated. There must still be time and patience to make revisions in scripts, materials, production techniques, and even to do re-testing. Whatever is learned from pilot evaluation is put to use in the revision of still unproduced scripts and in adjustments of performance and production.

Recognize Importance of Question Design. One of the most important skills for those engaged in formative evaluation is question design. The questions used in focused interviews, questionnaires, and other written instruments seem so easy to compose, but all too often they produce responses which are ambiguous, misleading, or extremely difficult to classify. Unfortunately, those inexperienced in research often fail completely to recognize the unreliability of the data collected. The quality of whatever research is undertaken should be maintained through continuous and objective scrutiny of the survey instruments by persons with research expertise.

Evaluation of effectiveness, interest in topics, utility of content, attitude change, and level of comprehension are among the procedures in which question design and careful interpretation of responses are especially sensitive matters. When data is collected from teachers or audience members, great care should be taken to avoid or detect response biases such as a desire to show successful cooperation, enhance self-image, or to say whatever will please those in authority.

Remember the Need to Adapt Instead of Adopt. Caution is essential in Third World

use of research techniques and communication models developed in Western nations. The local social or cultural context may require substantial modifications in standard research procedures, or even development of new means of gathering information, sampling attitudes and responses, testing comprehension, measuring credibility, and evaluating effectiveness. Patterns of information dissemination, criteria for credibility, systems of social values, as well as audience needs and interests are likely to be entirely different from what is found in the more developed countries. The importance of reinforcement and change agents, and the role of government in the communication chain, are among the factors that may create attitudes and concepts of communication that are unique to a country.

The discussion here has been directed toward formative evaluation as applied to radio and television used for educational and instructional purposes. It must be observed that formative evaluation can be equally useful in the preparation of books, films, pamphlets, and any other materials to be used for education or information. Formative evaluation is needed to free us from dependence on assumptions and weakly supported conclusions as to the nature of intended audiences and the best way to structure media materials. Third World countries may find that the answer to their particular needs for improved suitability and effectiveness of communication content may lie in formative evaluation.   ∎

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Message Testing

For those involved in planning and producing successful public service announcements (PSAs), having some means to measure message effectiveness is essential.

Making PSAs Work, now available from the National Cancer Institute, offers guidelines for producing effective messages and for planning, pretesting, implementing, and evaluating a PSA campaign. The handbook is an outgrowth of research by the Health Message Testing Service (HMTS) which, between 1976 and 1982, tested about 100 radio and television PSAs related to health issues.

Copies of the handbook are available free of charge from: Rose Mary Romano, Office of Cancer Communications, National Cancer Institute, Building 31, Room 4B39, Bethesda, MD 20205, USA.

day by day and week by week, but the largest section of EAB deals with print. They produce a bi-monthly farmers' magazine, za Ahukumbi, as well as posters, leaflets, and pamphlets.

Most spectacular are their cinema vans. At one time of our visit they had 17 bright yellow converted land rovers. They were each staffed by a team of two and showed puppet plays on agricultural themes during the day, and a film show during the evening. As they drove round, they were accompanied by the extension agent for the area where they were working that day. The evening cinema shows consist of some agricultural films, made by EAB, some entertainment films, and some government information films from departments other than the ministry of agriculture. In this way, EAB films probably reach about half a million people a year.

Finally, EAB has a well-developed program of research and evaluation of its own work. An Evaluation and Action Research (EAR) unit monitors and measures the rest of the work of the Branch in an attempt to increase its effectiveness, and feeds the results of its findings into the production of print, of radio programs, and of the films and puppet plays.

INADES-formation

INADES-formation is the training section of INADES, the Institut africain pour le développement économique et social (African Institute of Economic and Social Development). It was established by the Society of Jesus in the Ivory Coast with the general aim of 'working towards the social and economic development of people, while giving particular importance to their free and responsible participation in the transformation of their society.' Although its headquarters is in Abidjan, it works in 14 different African countries, mainly but not exclusively in francophone Africa. Its main function is to teach peasant farmers and extension agents.

It does this in three ways: through running face-to-face seminars, by publishing a magazine, Agripromo, and through correspondence courses. The correspondence courses are written, edited, and printed at the headquarters office but are administered, and adapted, where necessary, at the national offices. A key feature of the courses is that they explain the principles of good agricultural practice and do not limit themselves to teaching narrow techniques. They are aimed both at individual farmers and at extension agents, and INADES-formation is adamant that it needs to work with both groups. It needs to work directly with peasant farmers partly to keep itself in touch with the realities of ordinary farming, and with extension agents because that is an important way of sing their effectiveness and so improving asant agriculture more widely.

Beyond that they argue, 'the institute tries, as part of its training, to put peasant farmers and development agents in touch with each other and to help them establish a dialogue to provide better mutual understanding and greater effectiveness.' In Cameroon they work closely with the government in providing in-service training to extension agents, and success in the correspondence course is a requirement for promotion.

In 1978/79 INADES-formation enrolled some 4,500 farmers and extension agents as students, of whom about 600 were in Cameroon and 1,000 in Rwanda. They enrolled for a year at a time. INADES-formation courses consist of nine or ten booklets which students study over the course of a year. Most students enroll as individuals and must, therefore, be literate. INADES-formation has experimented with group enrollments and group study but has not yet found a satisfactory formula for these. Correspondence students may also attend seminars conducted by INADES-formation but do not have to do so. They work through their correspondence lessons and complete an answer sheet at the back of each one, which they send to a national or regional office for marking.

What Sort of Institutions Are They?

The contrasts between the organizations should not blind us to their essential similarity. Both want to teach farmers better techniques of agriculture. Both were established as a response to the fact that agricultural extension agents cannot meet all the farmers in their area. Even with the relatively favorable staffing ratios in the Malawi extension service, it is unlikely that agents can ever see more than half the farmers they are, in theory, serving. The ratio is much less favorable in many parts of the Cameroon.

Despite the similarity of aim, the difference in methods and in philosophy of the institutions are, indeed, striking. The Extension Aids Branch works in a single country; it uses a variety of mass media, with print playing very much a minor role; it is part of the Ministry of Agriculture. INADES-formation is an international and non-governmental organization; its use of mass media is almost confined to print; its relationships with government are necessarily subtle.

There is a difference in educational approach, too. EAB is attempting to reach the largest possible audience but, in the past, has assumed that its function was simply to tell them what to do, instruct them in better techniques, rather than teach general principles of agriculture and then their specific application. Although INADES-formation, with its printed courses and magazine, could attempt to reach a large audience—though inevitably far smaller than could be reached by radio—it has not attempted to maximize its audience. In part this is because it has tried to link its correspondence work with some face-to-

face seminar study, and, for the most part, has itself organized these seminars rather than meshing in with training sessions run by government and extension agencies.

Effects and Costs

What evidence there is confirms that the methods used by both institutions are effective. Farmers have learned from the radio programs and the mobile vans of Malawi and from the correspondence courses of INADES-formation. In Malawi, radio appears to be an important source of information for a considerable number of farmers, and already reaches some 30 percent of them directly. Both radio and mobile vans attract audiences of women, who are generally not contacted by extension agents. Studies have shown gains in knowledge for students working on INADES-formation courses while the statistics on completion rates show that the courses are so highly valued by participants that they work more assiduously on them than many correspondence students taking examination courses.

We can summarize the results briefly by saying that the Extension Aids Branch makes a significant but probably small change to the knowledge of a very large number of farmers while INADES-formation make a very large change in the knowledge of a small number. Of course there are limits to the jobs which can be done by mass media: these encouraging but tentative results do not suggest that mass media can replace traditional extension services, but they do show that they can play an important part beside them.

We look in some detail at the costs of both agencies. In Malawi, we compared the costs of the various media used by EAB with the costs of contact with an extension agent. (This does not, of course, imply that each type of contact is equally effective.) In 1980 US dollars, the costs were of the following order:

Cost per contact hour by radio	$0.004
mobile unit with films	$0.168
mobile unit with puppets	$0.083
extension agent	$10-$30

To put it another way, the mobile van is 44 times as expensive as radio, while extension agents cost 55 to 80 times as much as the mobile unit. Extension services are 2,000 to 3,500 times as expensive as radio.

The costs of teaching a correspondence student for a year—leaving aside the cost of any seminars—appears to lie between $90 and $225, with the lower figure for Rwanda where the population is denser, and enrollments higher, than in Cameroon. High as these figures are, in comparison with those for very much larger numbers in Malawi, they appear to compare favorably with the cost of residential training in agriculture which is the only alternative locally available

Agricultural Extension and Mass Media

by Hilary Perraton

The International Extension College (IEC) is particularly interested in the use of distance teaching for non-formal and rural education. Hilary Perraton, one of the IEC's directors, looks at two ways in which media have been used in this area.

Agricultural extension has a long history. It began 11 millenia back when the first cultivator said to her sisters 'you don't have to traipse all over the country at harvest, you know. All you've got to do is sprinkle some of the grain in the earth behind the cave. My friend and I have done this for years. . . .'' A more formal extension service existed in India in the 13th century, offering advice and rural credit. In the 19th century the nexus between learning and the land was institutionalized in the United States with the Morrill Act and the establishment of the land grant universities. Today many countries, rich and poor, have extension services. There is so much experience of them, and their organization plays such a big part in the work of many ministries of agriculture, that it ought, by now, to be possible to say how extension services work best, and how they can best be organized. In practice things are much less clear cut. As a result we don't actually know nearly enough about how effective agricultural extension is.

We do know something about its problems, which have been extensively documented and discussed. Often, there are too few agricultural extension agents who can visit a minority of farmers. Inevitably, they tend to visit rich farmers rather than poor, and men rather than women. Often, they are inadequately trained and inadequately supervised. Sometimes they lack the technical information which would make a difference to farming.

As ever, defining the problems is easier than solving them. Two kinds of solutions have found most favor in recent years. First, in some parts of some countries, it has been possible to create much more intensive extension services, with a far more favorable ratio of extension agents to farmers. Second, in schemes like the Kenyan PIM (Programming and Implementation Management) and the World Bank's Training and Visit Program, the stress has been on better organization and control.[2] But both of these solutions have one thing in common: they are labor intensive and therefore pose problems where the expansion of extension services runs up against budgetary limits.

The Role of Mass Media

The cost of orthodox extension, the cost of improving it, therefore provoke an obvious question: can mass media take over any of the functions of extension? On the face of it, they might be able to. For one role for extension is to provide information to farmers—something which can be done by radio, by print, by cinema vans, and the like.

In practice, mass media have, for years, been used by and with extension services. Agricultural broadcasting, for example, goes back to the 1930s and many extension departments also run agricultural information services. But not much is known about their effectiveness. Over the last two years, therefore, we have been looking, on behalf of the World Bank, at some of the questions about using mass media for agricultural extension. Within a broader study[1], we have, with aid from Unesco, looked in detail at the work of two units: *INADES-formation* in West Africa and the Extension Aids Branch of Malawi, and recently published case studies on both of them.[4] The *INADES-formation* study is mainly about Cameroon but looks also at their work in Rwanda and the Ivory Coast. The two organizations are very different, but some general conclusions do emerge from a comparison between them.

Extension Aids Branch, Malawi

Malawi has an extension service, with extension agents throughout the country, which reaches farmers in three ways—through extension agents, through farmer training centers, and through mass media. The Extension Aids Branch (EAB), which is part of the extension service, is responsible for its media work. It has a staff of about 100 who work on radio programs, on producing printed material, on running a cinema van service, and on evaluation and research.

EAB broadcasts four and a half hours of radio each week and has six regular radio programs. They include a general program which makes extensive use of interviews with farmers, a music request program in which the music is interspersed with farming advice, a farming family serial, and a daily broadcast of agricultural news and information. The radio programs are, in a sense, the most popular work of EAB, as they must go out

Folktales to Texts; Formative Evaluation; IEC; Ag. Extension; Computer Cautions