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ABSTRACT

Radio is recognized as a powerful but underutilized educational medium, and ways of improving the cost-effectiveness of the educational use of radio are discussed. Topics include the meaning of and need for cost effectiveness analysis, building an information system for cost effectiveness analysis, and five factors affecting cost effectiveness--(1) action research, (2) radio complementing other media, (3) diverse audience needs, (4) untapped resources, and (5) the scarcity value of resources in management decisions. (Author/CMV)

IMPROVING COST-EFFECTIVENESS OF RADIO EDUCATION

by

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Introduction

I want to make first a general comment about radio as an educational medium. Radio is a powerful educational tool which is grossly underutilized. In the Latin American nations, particularly through the efforts of the affiliated bodies of ALER (Associacion Latinoamericana de Educacion Radiofonica), educational programs by radio offering systematic instruction to listeners, ranging from a few hundred to close to two hundred thousands who are not reached by other educational vehicles, have become a distinctive feature of the educational scene. This is not the case in the Asian and African regions of the Third World, where radio school is a rarity and instructional radio used as a supplement to the formal school program is also not too common. But even in Latin America, where the radio school approach has originated and widely spread, the power and potentiality of radio is far from being fully exploited.

Radio is a powerful educational medium, because, as Wilbur Schramm would say, it is a little medium that can perform a big task. Radio is little in terms of relative cost and complexity of maintenance and operation. Overall radio costs for comparable audience and educational content have been found to be from one-quarter to one-eighth of the costs of different types of television facilities and films. Radio can be used without the existence of widespread electrical mains at reception points, does not need sophisticated machinery, maintenance is not difficult, and does not depend for operation on highly trained operators--qualities that are important in developing countries. Yet it can reach hundreds of thousands of learners and be the main vehicle for carrying a full range of instructional content. Radio can and does reach those learners who are unreachable by the regular educational institutions and

other mass media. And unlike other mass media and contrary to the general notion about it, the radio program can to a large extent be localized and adapted to the needs of specific audiences by using different time slots or broadcast channels or by using regional transmission facilities--both forms of adaptation feasible because of the relatively low costs involved.

Cost-Effectiveness Analysis

Realization of the tremendous educational potentialities of radio--whatever the scope and objective of a radio-based educational program--depends to a large extent on utilizing cost-effectiveness analysis as a management tool for the program. Cost-effectiveness refers to the relationship between the resources--financial, physical, and human--used in a program and the intended results and consequences of the program. The aim of a program of course is to maximize the positive results and the desired consequences at the least possible cost.

Examining cost-effectiveness would, therefore, involve the analysis, on the one hand, of the resource inputs (financial and real) and, on the other hand, the assessment of the results and consequences. Quite often we find that one of these two are looked at thoroughly and the other is ignored or not given sufficient attention. The economist may examine the costs and the budget usually only in financial terms and may only cursorily look at the learning outcome (mostly the numerical values only); whereas, the educational expert would be concerned with educational results and the preceding pedagogical processes without sufficient attention to the cost side of the equation.

Need for Cost-Effectiveness Analysis

As those involved in managing programs find out everyday, we have limited resources and unlimited needs. It is not very useful to examine the costs or the educational results without relating them to each other. I don't know what to think of a program if I am only told that it has made hundred thousand people literate or has helped to improve the nutritional

condition of 10,000 children unless I am told what costs have been involved. Similarly, I can hardly form a judgement about a program if I am only informed that its annual budget is one million dollars.

There are different levels of complexity, sophistication, precision, and elaborateness that can be applied to the analysis of both the inputs and the outputs of a program. There is also much room for argument about concepts, definition of terms, methods of measurement and assessment. There is a tendency among managers of educational programs to be intimidated or mystified by the supposed complexity and methodological difficulties of cost-effectiveness analysis and thus to avoid such analysis. There is also a somewhat contrary tendency in some instances to embark on too complicated and elaborate an exercise in which the primary purpose of cost-effectiveness analysis is lost and which itself becomes rather costly in terms of high-level manpower and money (and so can be only a one-time ad hoc exercise).

It need not be either. Cost-effectiveness analysis can be and should be regarded as an essential management tool in every program and an uncomplicated and basic information and feedback system can be set up in every program to provide the basis for examining the costs and the results of the program at any time.

Information System for Cost-Effectiveness Analysis

I will attempt to outline the basic information needs for cost-effectiveness analysis of a radio education program.

On the cost or input side, it is useful to have a breakdown of the costs by three major operations in a radio program--production, distribution, and reception. Production costs will be those related to planning, selecting, designing, preparing and producing the educational content material to be disseminated. Distribution costs will refer to the costs for the dissemination process--transmission facilities and relay facilities, that is, the main hardware for radio broadcasting and the associated engineering and maintenance

staff. The reception costs are those for owning and operating radio receivers, costs connected with organizing and maintaining listeners' groups, and costs for supervision of groups and feedback from listeners.

In addition to the three main categories there will be certain overhead and central costs which cannot be assigned to any of the three categories.

The significance of the three way major division of costs is that they can vary independently and can be controlled independently by planning and management decisions. For instance, the number of listeners may increase substantially raising the reception costs while production and distribution costs may remain unchanged. Similarly, new learning materials may be developed or new transmission facilities may be installed to localize programs without affecting correspondingly the other types of costs.

It is important and customary to make a distinction between capital and recurring costs. This distinction can be made again under the three operational categories of production, distribution, and reception. In many instances it would be misleading not to separate heavy initial development costs from regular capital and recurring costs when a new program is being developed and planned and specially when the initial costs are inflated by the use of expatriates financed by external donors.

It will be necessary to impute estimated financial values to donated services and in-kind gifts or services and goods offered at subsidized prices so that the resource inputs are not underestimated. In some instances, it may be useful to separate estimated values of voluntary services and gifts from the financial costs.

If there is more than one major project managed by the same organization (such as more than one category of audiences, or major supplementary print media operation) it would be important also to apply project-wise division to the costs. In other words, the principle of program budgeting should be used when the total program is complicated and serves different clusters of educational objectives and clienteles.

A separate accounting should be maintained to identify the major sources from whom the resources are derived in order to both tap the full potentiality of the sources and also to maintain a check on who benefits and who pays for the educational services.

A cross classification between sources and the project categories and the three-way operational categories may not be possible because funds often come to the organization for general use.

A simple tabular representation will help to clarify the suggestions made above.

Organizing Cost Data for Cost-Effectiveness Analysis

	Project I			Project II			...etc.
	Capital used up	Recurring Cost	Initial Development Cost	Capital used up	Recurring Cost	Initial Development Cost	
Production							
Distribution							
Reception							
Total							

Grand Total _____

Overhead _____

The recording of the capital costs presents some difficulty. It is inappropriate to lump capital costs with other items in the annual budget, because the capital assets will be used for several years. For cost calculation purposes the fair discounted value of the capital assets used up in a year can be added to other annual costs. When the same capital assets are used for more than one project, it will be necessary to distribute the capital costs among the projects.

This record keeping will probably not satisfy some economists and researchers and it is not yet a full application of the program budgeting principle. But it has the virtue of simplicity and would be a dramatic improvement in far too many cases upon existing cost data.

On the output side three types of information are important: quantitative information about learners and the immediate learning results; information about how the learning has affected the behavior and the life situation of the learner; and information on learner variables or the characteristics of the learner.

Unless the programme is based on open broadcast without any control over reception, the quantitative information about learners is not difficult to gather. It is also not difficult to collect learner variable information of the type being suggested here. The information about learning effectiveness--in other words, whether the objectives of the program are being achieved--is more difficult to collect and will involve subjective assessment rather than only quantitative measurement. In this case, the technique of household sampling by trained field investigators can be used to a great advantage. The mention of household sampling need not frighten anyone. It need not be a large-scale and elaborate exercise, need not be expensive, and a very small number of field investigators who can be trained quickly can do the job. The gain in improved cost-effectiveness analysis and program management is well worth the small cost and effort needed.

The types of information gathered on the educational output side will include the following:

1. Quantitative information about learners and immediate learning outcome.
   - -- Number enrolled for the program
   - -- Number completing a sequence of the program
   - -- Some indication of cognitive gain of the learners either through a simple test that is administered in the program or by some other specified feedback method.
2. Learner characteristics
   - -- Age distribution
   - -- Educational distribution
   - -- Sex distribution

-- Income distribution

-- Land-ownership distribution if relevant

-- Ethnic distribution if relevant

-- Distribution of any other variable relevant to the objective of the program

The learner variables would tell us if the appropriate audiences are being targeted, who are benefitting to what extent from the program (when cross-checked with other information), and if a differentiated communication approach is needed. Sampling techniques can be used for collecting information about certain learner variables if necessary.

3. Household sampling.

A checklist or simple questionnaire can be used by the field investigator in order to check on:

-- Knowledge and attitudes by what the learner says;

-- internalization and acceptance of the new knowledge and attitude by what the learner says he does;

-- practice by observing in the household and in the community the evidences indicative of results of the new knowledge and learning.

The emphasis of the survey is on the learner in his household rather than as an individual because of many of the current radio-based programs should be evident in the household; though in other cases the focus may be the individual.

Use of the data

Collection of the information checklisted here does not, by itself, constitute cost-effectiveness analysis. These data provide the essential raw materials for the analysis. But that is not a mysterious and complex process. Someone with basic training in economics or statistical analysis can take these data and provide various cost measures and other information useful for program management. For instance, one could erive from the above data per capita cost, lesson-hour cost, average cost, fixed cost, variable cost, and marginal cost for the whole program and its component projects. One can

set up program budgets that allocate costs to educational purposes rather than administrative line items. One can also reach conclusions about what educational results in quantitative terms are being bought for what money.

Besides the quantitative measures of costs and benefits, the above analysis provide the basis for some important judgemental conclusions:

(a) how effective the program is in terms of its objectives;

(b) where some problems may lie, for instance, there may be too little resources going into organizing the reception end effectively or the cost of distribution may be inordinately high compared to the benefits of localized and specially adapted broadcasts; and

(3) what the costs will be if some changes are made in any phase or aspect of the program.

One of the priority tasks for an organization like ALER probably is to carry out some initial exercises of cost-effectiveness analysis of the affiliated programs and come out with some practical and operational guidelines for establishing simple information and feedback systems for cost-effectiveness analysis and improved management of programs. Even an ad hoc exercise--since systematic information gathering and analysis do not happen in many programs--specially, if it is carried out comparatively, can yield useful specific lessons for better use of resources.

It would have been more satisfying to me and probably more interesting to you if I had the opportunity to examine a number of the radio school programs from a cost-effectiveness perspective and draw out the relevant conclusions and recommendations. Not having had this opportunity, my discussion is somewhat general.

Factors Affecting Cost-Effectiveness

Important as cost-effectiveness analysis is, you will note that such analysis points out the deficiencies of a program--that the educational goals are not being reached, that there are imbalances in resource allocation, that the resources are being wastefully used. It also may help to define the nature of the problem and indicate the phase or element of the program where

the problem lies. But it does not necessarily provide us the solution or show us the corrective steps to be taken. This is not surprising because cost-effectiveness analysis concerns the relationship between the input and the output of a program and both the input and the output in educational programs are affected by various factors external to the educational process itself. This is not the place to discuss the extraneous factors impinging on the educational process. I want, however, to point to a number of measures which are external to the process of cost-effectiveness analysis but which have important bearing on improving cost-effectiveness of educational radio. These are: (a) action research for educational needs assessment and for validating the content and the method; (b) use of radio to its best advantage by complementing it with other media; (c) use of the full potentiality of radio for meeting diverse educational needs; (d) mobilization of unutilized and untapped resources and (e) recognition of the scarcity value of resources in management decisions.

Action Reserach

The mention of action research should not frighten anyone or draw a skeptical look. It simply refers to the systematic examination of any problem or situation which has an important bearing on the educational program in order to find answers to questions important to program planning and implementation.

In radio education programs action research should be used at at least two stages--initially to diagnose the general situation of the potential learner and his environment, to determine whether the hypothesis about his learning needs and motivation is valid, and to find out whether the learning needs can be met by the medium of the radio and the complementary tools. Most educational programs begin with some hypotheses about certain educational needs, about the situation and the motivation of the learner, and about the effectiveness of the medium used. It is, therefore, essential

that some efforts are made to determine if an educational program can be launched on the basis of these hypotheses.

After the diagnosis of the learners' environment, motivation and educational needs, the instructional program itself is designed with its content, sequence, methodology, etc. This design is partly based on the diagnostic exercise if such an exercise has been carried out, but mostly it is based on the hypotheses, preconceived notions and past experiences of instructional programs. Again it is important to find out if the materials and the methods will serve the educational purpose by trying out the initial samples of the materials with the target audience and by monitoring the results of this try-out. If the whole sequence of instructional materials is developed without such pre-testing, it would be like shooting in the dark.

Carrying out household sampling or learner surveys to evaluate educational results, mentioned earlier, is also a form of action research and suggests that a third important stage of action research is the evaluation of the learning outcome.

Inclusion of action research in program planning and management need not be expensive and should not require a large staff. What is essential is one or two of the program managers systematically searching for answers to important operational questions and the refusal of the program management to accept preconceived ideas and solutions without seeking to establish their validity in the given situation.

Complementary use of other media

Radio is a powerful medium; but as the Latin American radio schools have demonstrated, the power is derived from the use of radio with complementary printed materials, correspondence, and face-to-face interaction of listeners among themselves and with a monitor. All experiences suggest that, by itself, radio cannot be expected to be the vehicle for a major learning

program or have a sustained and deep learning impact. While this principle is accepted in most radio education programs, probably more attention can be given to the complementary media in many situations. For instance, in many cases, the face-to-face interaction at the reception end can be improved by providing guidance about the organization of listening groups, arousing interest in communities to support such groups, offering better orientation and instruction to monitors, offering some incentives for establishing a group identity and maintaining group cohesiveness. Similarly, more systematic use can be made of print media and correspondence. The additional cost is likely to be more than compensated by educational gains.

Meeting diverse educational needs

Various educational uses of radio have been demonstrated by different programs. For instance, radio is used as part of formal education to supplement regular teaching; it serves as the substitute for formal education at all levels; it is used for general and continuing education for adults; it offers programs for special interest groups such as women, youth, farmers and teachers; and it is used to carry on campaigns with specific objectives such as voter registration, use of sanitary latrines, and prevention of soil erosion.

When there are urgent needs for serving diverse audiences and objectives, as is the case in developing nations, and when the infrastructure for a program with production, distribution and reception components is already established, it pays to attempt to gradually expand the scope of the program to serve the various audiences. The additional costs are likely to be low in relative terms, overhead and central costs are reduced, and there is a gain in qualitative terms through the interaction of approaches and methods and the creative people in the various sub-programs, provided the management can take advantage of the situation.

It is, of course, necessary to remember that a program should not

undertake educational tasks that cannot be done well by using radio as the principal medium.

Untapped resources

The most important resource in all educational programs and which can make a real difference in the cost-effectiveness of a program is the motivation and enthusiasm of the learners. For radio education, it is the motivation and willingness to learn of the listeners that determines the success of the effort. If the listener groups and their respective communities are sufficiently enthusiastic and involved in the program, they can take over completely the organization and management of the reception end including the necessary costs. Besides the operation and maintenance of the receiver, and possibly correspondence feedback, other costs may be nonmonetary and may be contributed by the community--in the form of a place to meet, and voluntary services of a monitor, knowledgeable individuals from the community to serve as discussion leaders and leaders for organizing follow-up activities. For each community the contribution would be small, but the burden would be heavy for the program's central organization even if a part of the local costs are to be borne by it.

Scarcity value of resources

A program's cost-effectiveness will improve if resources that are more plentiful and cheaper can be substituted for resources that are scarcer and more costly. This is a commonsense principle, but often it takes some ingenuity to apply it because the possibilities of substitution are not readily apparent. There are possibilities of using a larger number of part-time volunteer monitors for listening groups instead of a smaller number of paid personnel; persons with technical and specialized competence are sometimes used for nontechnical tasks which could be performed by substitutes; there may be some advantage in substituting broadcast messages for written or printed materials in some situations such as in replying to listener correspondence or providing instruction to field staff and monitors because

the marginal cost for broadcasting is smaller than the cost of written communication.

One important application of the scracity value principle is in the case of external assistance. External assistance, while vitally important in many programs, should be carefully scrutinized especially if it is tied to certain gadgets and techniques because these may tie up costly human resources and impose difficult burdens of operation and maintenance without corresponding gain in learning. In such an instance it is preferable to stick to the simpler local technology and familiar equipment.

The suggestions made here are not novel. Many programs are already following some of these. Others undoubtedly apply implicitly and intuitively some of the principles and logic behind these suggestions. Most programs, however, can benefit by a more systematic and deliberate attention to these suggestions.

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