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9. ABSTRACT

The format of a one-year research project concerning El Salvador's Educational Reform. Its purposes are: 1) to ascertain the effects of Instructional Television (ITV); 2) to derive principles and guidelines from El Salvador's Reform for use in other countries; and 3) to contribute, by means of communication research, to the Reform's efficiency. The report then elaborates on the types of research to be done: 1) on attitudes of, and cognitive and behavioral changes in pupils, teachers, and school administrators; 2) an "administrative record" and on potential problems in administrative relationships and policy-making procedures; and 3) application of research to increase the Reform's efficiency. Necessary limitations of time and facilities also are recognized and discussed.

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**Research Report No. 1**  
**of the**  
**Study of Instructional Television in El Salvador**

**DESIGN OF THE STUDY**

**Institute for Communication Research, Stanford University**  
**Academy for Educational Development, New York and Washington**

**U.S. Agency for International Development**

**December, 1968**

## THE EL SALVADOR EDUCATIONAL PROJECT

The Government of El Salvador, with the assistance of the United States Agency for International Development, is engaged in extensive educational improvement and modernization, through curricular revision, retraining of teachers, and introduction of classroom television.

In calendar year 1968, the curriculum for the seventh grade (the first of three school years known as Plan Basico in El Salvador) has been revised, approximately 120 teachers have gone through the first two months of a three-months course in teaching the new curriculum, and preparations have been made to telecast lessons beginning with the new school year in February, 1969.

During 1969, pupils in approximately thirty seventh-grade classrooms will be taught the new curriculum by teachers who have graduated from the three-months course, with the aid of television lessons that will fill part of the instructional period. A certain number of additional classrooms will be taught the new curriculum by teachers who have graduated from the course, but without the aid of television. Revision of the eighth-grade curriculum will begin, and a number of teachers will receive a full year's course in the new curriculum and in the use of television.

During 1970, the pupils who have had the new curriculum in the seventh grade will move into classes using the new eighth-grade

curriculum. A much larger group of seventh-grade pupils will be using the new curriculum with television. And curricular revision will move into the ninth grade.

This is the general phasing of the project. Whereas in 1969 only about 1,000 Plan Basico students will have the advantage of the new curriculum with television, by 1972 it is expected that 49,000 day students and 26,000 night students in Plan Basico will be so taught, and the curricular revision, teacher retraining, and introduction of television will have moved into the primary schools.

For a more detailed account of this project see the AID document entitled El Salvador: Educational Reform Program Including ITV (AID-DLCP-738), or the summary document prepared for this project, Some Background Information on the El Salvador ITV Project.

#### THE RESEARCH PROJECT

A research contract, terminating in late August of 1969, has been awarded by AID to the Academy for Educational Development, who have asked Wilbur Schramm, of the Institute for Communication Research, Stanford University, to serve as principal investigator during that time, and the Institute to provide U.S. research personnel during the period of this contract. Emile McAnany has been sent to El Salvador as field supervisor of the research. He is working with a Salvador staff -- an educational psychologist, a research assistant trained in economics and field research, and a secretary. Four men

are providing research support at Stanford, and part-time service in El Salvador.

The research has been asked to be responsive to three general needs:

(1) To ascertain as fully as possible the effects of the use of instructional television in El Salvador;

(2) To derive principles and guidelines from the El Salvador experience that will be of use to others who use instructional television, especially in developing countries, and also to donor agencies and teaching institutions.

(3) To contribute, so far as it is possible to do so by the use of communication research, to the efficiency of the El Salvador project.

#### NECESSARY LIMITATIONS ON THE RESEARCH DESIGN

There are problems in designing a long-term study that might last only one year. The El Salvador educational reform project will have at least five important years of development, perhaps ten. The research connected with it, however, will terminate (so far as the present contract is concerned) shortly after the second half of the first year of television teaching -- in August, 1969. It is necessary, therefore, to plan somewhat less freely and grandly than one otherwise might, and to try to design activity that will yield significant results in one year and still be usable in a longer project if one comes into existence.

A further limitation is the nature of instructional television itself. In El Salvador, as in most other places where instructional television has been used in a sophisticated way, television is simply one element in a system-wide change, almost inextricably interwoven with other changes. Therefore, when one pretends to measure the effects of the television, it is necessary to be extremely cautious about distinguishing between its effects and the effects of other elements in the system.

For example, the basic innovation in El Salvador is a new curriculum. Although one can compare in some respects what happens under the new curriculum (with television) against what happens in the old curriculum (without television), it would be very difficult indeed to try to separate out the effects of the television from the effects of the curricular change. It is apparently going to be possible to control for the effects of the third major element of educational reform -- the retraining of teachers -- because certain classes taught by the retrained teachers during the first year will use television, and others will not. But even in this case, as the project goes on it will become increasingly necessary to deal with combinations rather than single elements.

To an educator, concerned with the effects of his system, this may not present an important problem: he wants to know how the whole system is working. For the sake of system design, however, it is important to separate out, wherever possible, the results of the several elements.

A third problem in research like this is the difficulty of designing field experiments with adequate controls, especially where an ongoing project is being studied and research has not been built into the project design itself. School systems are usually willing to tolerate research when it can, in effect, look over the shoulders of the main actors and not get in their way. The more complex and difficult the project in educational change, the less willing school systems are to permit interference in the interests of research reliability -- for example, the random assignment of pupils, or the creation of experimental or control groups not otherwise a part of the project.

Finally, it must be pointed out that the contract funds do not permit massive or highly detailed research of the kind that might seem desirable.

#### THE MEASUREMENT OF EFFECTS (TASK ONE)

Out of a very large continuum of effects of instructional television, we propose to deal with three main classes of effect -- attitudes, cognitive changes, and behavioral changes -- on three main groups of people -- pupils, teachers and school administrators, and, so far as possible, adults in the surrounding community.

On all these people there will be attitudinal effects that can be measured by scales or projective tests of one kind or another. That is, we can identify changes in attitudes toward school, toward instruction by television, toward the substance of the new curriculum,

toward the role of the teacher and the student, and toward a number of specific topics related to the educational experience.

In the second place, there will be learning effects on both pupils and teachers, and perhaps on adults in the community as well. These can be measured by tests of learning.

But there will be many more cognitive effects beside the learning of course content. We can expect, for example, that the new kind of teaching will make some difference in the way a student faces and solves a problem, and indeed in his interest in seeking out and solving problems. We can expect that teachers will change their concept of a teacher's role. We can expect in time that the community may change its concept of the role and usefulness of a school education.

In the third place, we can expect that the introduction of the new curriculum, the training courses, and the example of instructional television will make differences in what happens within the classroom. We are entitled to expect, for example, that the interaction between teacher and pupil in El Salvador classrooms will move up the ladder of school performance described by Beeby, in The Quality of Education in Developing Countries from Stage One (rote learning) toward Class Four (problem solving and individual initiative in studying). We should anticipate that classroom observation would reveal progressive changes in the direction of less rote drill, less lecturing, less close attention to syllabus, more discussion, more questions from students, more consideration of the surrounding environment and current problems, more individual assignments.

In the functioning of the school we can expect behavioral changes also, perhaps the kind of change in principals' and supervisors' roles that have been seen in Samoa. And in the community there will probably be some kind of behavioral effects resulting from open-circuit television and from the changes in the role of pupils and the different approach to knowledge they will be acquiring.

This implies that instruments of the following kinds (among others) will be needed:

Attitude tests and scales for pupils, teachers, and school administrators, with as many items in common as possible, so that attitudes can be compared. These are already being made and tried out by the project staff.

Tests of learning of course content for pupils. During the first year of research, it has been decided to concentrate on measuring the learning of science, mathematics, and social science in the revised seventh-grade curriculum. Tests for these three subjects have been constructed by the Educational Testing Service, of Princeton, New Jersey, and are now being checked out in El Salvador.

Tests of other cognitive effects. Most existing tests in this area appear to have certain disadvantages for use in the El Salvador situation. It will be necessary, therefore, to examine these tests very carefully, to frame hypotheses as sharply as possible, and then probably to construct new tests and try them out.

Tests of classroom interaction. No existing tests seem to be satisfactory for this need. It will be necessary, therefore, to develop a sophisticated method for observing and recording classroom behavior of teachers and pupils, aimed toward testing hypotheses about changes in styles of teaching and learning.

Tests of community changes in behavior, attitudes, and concepts. These changes will be more difficult to see, and will appear later. Except for attitude measurements, which will be fairly routine, it may be best to approach the other measurements in the spirit of the anthropologist, observing and trying to develop insights and generalizations, before hypotheses are stated and quantitative measures developed.

#### COMPARISONS OF EFFECT (TASK ONE)

Changes can be attributed to the new system, or to elements of it, only if they are not found in the old system or other elements. Therefore, a key question in using the measures mentioned above is what groups can be compared, or how the significance of before-and-after measures of the same population can be interpreted.

There are no standardized tests of educational performance in El Salvador, and no other very good measures in use by which the changes wrought by instructional television can be interpreted. For example, in the United States it was possible to say that certain classes in Hagerstown had gained 1.5 years in one year of school, in

certain subjects, compared with the average gain of one year in a very large number of schools throughout the country, as measured by standardized tests. Nothing like that is possible in El Salvador, and it is therefore necessary to build in comparisons of another kind.

In some cases it is possible to compare pupils using the new curriculum with pupils still under the old one. This is the case, for example, with the measures of classroom interaction, some of the cognitive changes, and some of the attitude measurements. It makes no sense, of course, to compare learning in classes using the new curriculum with learning in classes using the old one, because the substance of the courses will not be the same.

During the first year, and probably in succeeding years, it will be possible to separate out the effects of the instructional television to some extent, in the way mentioned. These comparisons are somewhat confounded by the anticipated reluctance of the schools to assign pupils at random, for which even the use of analysis of covariance will prove an inadequate substitute.

In some comparisons, of course, before-and-after measures, with ordinary measures of statistical significance, will be useful. Such comparisons include comparisons of teacher attitudes before and after the three-month training course; teacher attitudes at the beginning and at the end of their first full year of teaching the new curriculum, with television and without television; pupil attitudes at the beginning and the end of their first full year of

study in the new curriculum, with and without television; and styles of classroom interaction at the beginning and end of the first full year of the new curriculum, with and without television.

Very few measures of the surrounding community, of the more subtle cognitive changes in pupils, and possibly of classroom interaction will be obtainable in the first year because of the need to construct and try out new measures in those areas. However, it should be possible, during the first year of research, to test a large number of relationships which are of practical as well as theoretical interest. We can illustrate them here, without trying to include them all or to state hypotheses rigorously.

Concerning attitudes -- teachers measures

	At start of course	End of course	End of school year
(Toward the new curriculum)			
Teachers <u>with</u> ITV	} tc-1	} tc-2	tc-3
Teachers <u>without</u> ITV			tc-4
(Toward the use of ITV)			
Teachers <u>with</u> ITV	} tt-1	} tt-2	tt-3
Teachers <u>without</u> ITV			tt-4

With these measures, we can then test hypotheses built around the relationship of tc-1 and tc-2 (does the training course result in

more favorable attitudes toward the new curriculum?), tc-2 compared with tc-3 and tc-4 (does experience with the new curriculum lead students to hold more favorable attitudes toward it?), and tc-3 vs. tc-4 (does the use of television contribute to more favorable attitudes toward the new curriculum?).

We can also compare tt-1 and tt-2 (does the training course bring about more favorable attitudes toward television?), tt-2 and tt-4 (do attitudes toward teaching with television become more favorable with experience?), and (tt-3) - (tt-2) vs. (tt-4) - (tt-2) (does ITV look better from the inside or the outside?).

Of course the comparisons will be in more detail. They will consider kinds of teachers and attitudes toward specific aspects of teaching or of the use of television.

Concerning attitudes -- pupil measures

	At start of school year	At end of school year
(Toward school in general)		
Pupils <u>with</u> ITV	ps-1	ps-2
Pupils <u>without</u> ITV	ps-3	ps-4
(Toward the new curriculum)		
Pupils <u>with</u> ITV	pc-1	pc-2
Pupils <u>without</u> ITV	pc-3	pc-4
(Toward learning from television)		
Pupils <u>with</u> ITV	pt-1	pt-2
Pupils <u>without</u> ITV	pt-3	pt-4

In each of these topic areas it will be possible to compare 1 and 2 to find out whether the new curriculum creates more favorable attitudes, especially toward school and toward the curriculum. It will also be possible to compare the difference between 1 and 2 with the difference between 3 and 4, to find out what television contributes to changing attitudes toward school and toward the new curriculum. And the comparison of pt-3 with pt-4 will be especially interesting, because it will tell us whether pupils' attitudes toward learning from television improve in a year of experience with the medium.

As in the study of teacher attitudes, the analysis will necessarily be more detailed. What differences are there by kind of student, and what are the particular aspects of ITV, of the new curriculum, or of school, that are especially liked or disliked? To what extent are expectations of ITV fulfilled during the year? And if it is possible to obtain attitude measures toward school from a sample of pupils in the old curriculum, it will be most revealing to compare those with attitudes of students in the new curriculum, with and without television.

Concerning the learning of course content

	At start of school year	At end of school year
(Science)		
Pupils <u>with</u> ITV	s-1	s-2
Pupils <u>without</u> ITV	s-3	s-4
(Mathematics)		
Pupils <u>with</u> ITV	m-1	m-2
Pupils <u>without</u> ITV	m-3	m-4
(Social Studies)		
Pupils <u>with</u> ITV	ss-1	ss-2
Pupils <u>without</u> ITV	ss-3	ss-4

In each case the basic comparisons are between 1 and 2, and between 3 and 4 (do significant amounts of learning take place?); and between the difference of 1 and 2 and the difference of 3 and 4 (does television contribute to the amount of learning?).

Here, too, it will be important to bring in the differences in learning between kinds of students. But even more interesting will be the use of attitudinal data. How does a pupil's attitude toward school, toward television, or toward the curriculum relate to the amount he learns? How does a teacher's attitude toward teaching with television or toward the new curriculum relate to how much the pupils learn?

It may be possible to find a considerable number of items in the new tests which apply equally well to both the old and the new

curriculum. If so, it will be worthwhile to try to give the relevant part of the test to a sample of students in the old curriculum, so that we can get at least some idea of the comparative effect of the two curricula, with and without ITV.

Concerning other cognitive results

Until we can prepare and validate tests of some of these cognitive effects other than learning, any findings obtained must necessarily be preliminary and tentative.

However, given tests, it should be possible to find out some of the differences between role concepts of teachers in different parts of the system -- teachers in the old curriculum, those in the new curriculum without ITV, and those in the new curriculum with ITV.

A more difficult matter may be to measure the way a pupil in different parts of the system approaches problem solving, his skill in doing so, and his interest in doing so. Beyond that, it should be possible to ascertain some of the differences in the views of life and environment, of personal goals, responsibility as citizens, and occupational objectives, among pupils in the old curriculum, and in the new one with and without ITV.

Here again, the kinds of students, their attitudes and the attitudes of their teachers, and some of their learning performance can be related usefully to their cognitive measures.

Concerning behavioral effects

We might expect that in Salvador, as in several other countries, absenteeism would be less in classes taught in part by ITV, and perhaps in the new curriculum without ITV as well, than in classes using the old curriculum and without television. This can be tested from school records at the end of the year.

When procedures for studying classroom interaction are developed, it will be possible to begin to study the differences between what happens under the new curriculum and the old, and in classrooms with television as compared with classrooms without it.

When it becomes feasible to do so, we can test the learning and attitudes that result from different television treatments of the same topic, or different classroom handling of the same televised lesson. The dimensions of the research in this first year, and the importance of obtaining baseline measures will not permit this type of research at present. If the project continues, this type of study will doubtless become a significant part of the work plan; and pre-tests of sample programs should become a common practice.

## IDENTIFICATION OF GUIDELINES (TASK TWO)

The measurements of learning, cognitive, and behavioral effects of the use of instructional television will, as they accumulate, contribute to greater understanding of the use of the medium, especially when it becomes possible to test different treatments.

Meanwhile, it is proposed to undertake two sets of data collection especially intended to contribute to the planning and administration of future projects.

For one thing, an "administrative record" is being kept: what is being done in each month, in each part of the project. Strangely enough, no such records exist for any major instructional television project. Future planners and administrators could undoubtedly benefit from knowing how the different activities were timed and phased during the time that such a project was coming into existence.

In the second place, efforts are being made to collect "critical incidents" -- problems that occur in administrative relationships and policy-making procedures that are potentially dangerous and require special attention. Not only will such a collection indicate the variety and distribution of problems that must be faced by a developing project, but also it will show the changing nature of these problems as the project moves from stage to stage.

With both of these measures there are problems of devising instruments to collect the data. In this case, however, the problem is not the sophistication or complexity of the concept, but rather the challenge of devising a form and procedure simple enough to permit the recording to be done by the participants without research personnel having to do the observing themselves.

APPLICATION OF RESEARCH TO INCREASE THE EFFICIENCY  
OF THE SALVADOR PROJECT (TASK THREE)

All the research here described, of course, will make some contribution to the efficiency of the project in El Salvador. It is proposed, in addition, to apply some lessons learned from communication research, and from experience with other projects, to the collection of feedback information from the classroom. Forms and procedures will be suggested, and if possible different methods will be tried and compared.

As soon as possible, it is hoped to provide the capability for pretests of sample programs, and for tests of alternate treatments of televised lessons on samples of the intended audience. The recording is on such a tight schedule at the moment that it would not be possible to do any pretesting or treatment-tests, even if there were personnel and funds in the research contract for this purpose. By the late months of 1969, however, this should be possible.

FIRST-YEAR RESEARCH STRATEGY

First-year strategy is governed by the timetable of the educational reform project, the amount of work that can be undertaken under the contract, and the measuring instruments that will be available by a given time.

Summer and autumn, of 1968, are months of curricular revision and project development. The first teaching situation that can be

measured in the project is the three-months course for teachers, November through January. The first opportunity to study pupil learning and the use of instructional television is the school year, February to November, 1969.

Research personnel were in El Salvador in early September, 1968. Decisions on scope and goals of the research were made at a conference on October 3 and 4.

Exploratory attitude tests were made in October, and administered to teachers in the retraining course in November. Methods of recording both the administrative "log" of the project and "critical incidents" were tried out during the autumn, and a considerable amount of material has been collected. Tests of course content learning will be available by the time the school year starts in February. Procedures for recording classroom interaction cannot be tried out until the school year is under way and the baseline attitude and learning tests administered. Experimental instruments for studying other cognitive effects cannot even be available for trial use until late spring. Data on attendance and dropouts, of course, can be collected at any time, but the obvious time to do it would be at the end of the school year.

Therefore, the strategy for this first year of research is conceived as follows:

- (1) To collect ongoing administrative data (project log and timetable, and "critical incidents") as they happen;
- (2) To collect baseline data and comparisons -- attitudes and

learning -- on the critical periods when the new curriculum and the new ITV are first in use: which is to say, the teacher training course, November through January, and the first school year under the system, February to November, 1969;

(3) To be helpful to the educational reform project by applying previous communication research knowledge (e.g., on feedback) where the project desires it;

(4) To make a start at developing instruments and collecting some data on classroom interaction and cognitive effects in addition to learning;

(5) In general, to find out what research can be done within the El Salvador schools and how to do it with least disruption or objection; to prepare instruments and procedures for expanding the research (e.g., in classroom behavior and cognitive effects) during future years; and to explore the possibilities and needs for research on community effects -- so as to make the following years of research on this project as productive and efficient as possible.

#### TIMING OF THE RESEARCH

It is important to note that the research contract expires in August. Under these circumstances, therefore, it is possible to plan with some assurance only for data collection that goes to the halfway point (July) in the 1969 school year. If the contract is extended, there would be a great advantage in collecting after-measures at the end of the school year, in late October. The

following suggested timetable is compiled in that way. However, if the termination date is indeed in August, then all the activities listed for October should be moved up to June or July.

This is the timetable presently envisaged: (next page)

We do not know, of course how difficult it will prove to do some of this research and how long it will take under the conditions in El Salvador. We should like to do more, if possible, but this now represents our best estimate of what can be accomplished.

#### LOOKING AHEAD

Without trying to specify a work plan beyond the first year, it seems to us that this direction of development is suggested by the strategy of the first year's research:

(1) The gathering of trend and learning data will continue -- moving into additional grades as fast as the new curriculum and the television move, making it possible to study the effect of experience with ITV and the new curriculum, and to make grade comparisons.

(2) The measures of cognitive changes, other than learning, will be developed and used for a variety of comparisons including some very significant ones between the old and new curricula.

(3) The system for observing and codifying classroom interaction will be perfected, and will make possible a number of most illuminating comparisons, including some between the old and the new curriculum, between classes with television and classes without, and between teachers who have different role concepts.



(4) As time and staff become available for conducting pretests and alternate-treatment experiments, it should be possible to make significant contributions to the grammar, the rhetoric, and the context of teaching with television.

(5) The research will move into deeper administrative problems. Unit costs of the project should be studied carefully, and the problems and tensions, internal and external, of the project should be examined and evaluated, if the subject is not too sensitive.

(6) Finally, a training component should be built into the project at the first possible moment so that El Salvador can develop the human resources to take over and expand this kind of research itself.

To state the objectives of this study in another way, as the work goes on we should try to plan and extend it so that (a) we understand progressively better as many as possible of the causal elements that enter into as many as possible of the different effects of using ITV as a part of educational reform; (b) we should be able to contribute progressively more to understanding the conditions of effectiveness of ITV when used in that way; (c) we should come ever closer to the stage when our help is no longer needed in this research.