DOCUMENT RESUME

ED 090 107 SO 007 320

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TITLE A National Textbook Program: Promise and Frustration.
PUB DATE 16 Apr 74
NOTE 46p.; Paper presented to the American Educational Research Association (Chicago, April 16, 1974)

EDRS PRICE MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS Adoption (Ideas); Developing Nations; *Educational Change; *Educational Policy; Educational Research; Educational Theories; Experimental Programs; *Field Studies; Instructional Improvement; *National Programs; Research Design; Staff Improvement; *Textbook Research; Textbooks; Use Studies
IDENTIFIERS *Ecuador

ABSTRACT

In 1970 an evaluation of a national textbook program implemented by the Ministry of Education of Ecuador was carried out. The pre and post test design involved three treatment types: 1) classrooms with new textbooks, guides and orientation to teachers in the new textbook programs; 2) classrooms with new textbooks and guides but no teacher orientation; and 3) classrooms with other, or no, textbooks, and no teacher orientation. The design was field experimental with treatments assigned to particular schools. Findings, discussed and summarized, indicate that only the subject area of reading showed a significant interaction. Several significant differences between school types (graded, multi-graded and ungraded) were revealed by analysis. Only one out of nine comparisons was significant among the three field experimental conditions, with classrooms with new texts and no orientation having the smallest reading gains. Variables in the change process are identified in the discussion section and theories of adoption of change are related to the findings. References and supporting data are included in the report. (Author/KSM)

A NATIONAL TEXTBOOK PROGRAM: PROMISE AND FRUSTRATION

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Presented at American Educational Research Association
Chicago, April 16, 1974

In a nation reforming its educational system a national textbook program has been envisioned as a means of changing the entire system. It was designed to accomplish change by emphasizing new subject matter, stimulating teachers to use different kinds of methodology, standardizing the curriculum, coordinating the curriculum vertically by grading subject matter for appropriate age and grade levels, and making the curriculum materials more national in appearance.

A national textbook program is an attractive instrument of national educational policy because it supposedly does not require more teachers or classrooms, and allows a ministry control over the production, distribution and use of the most widely used instrument of instruction. In a nation where control of education is centralized in a ministry system, standardization of curriculum can be achieved by means of national curriculum guides and reenforced by means of a national textbook program. Before national textbook programs are introduced, rural teachers and students often have no materials in a developing country. Students copy oral statements on material written on blackboards in their notebooks. The emphasis is on memorization of concepts. Textbooks are available mainly in urban areas. When textbooks are used in urban areas they are not coordinated from grade to grade, vary widely in difficulty of content, and are often adopted because supervisors push them for friends who have authored them or who are selling them.

The organizational characteristics of a ministry are important to define as they affect adoption of change. Decisions are made at a national level which affect programs and materials at all levels. Structural and

functional characteristics worthy of mention include the following:

1. The major policy making professionals are in the ministry in capital city. Even if other major cities exist they do not house significant educational policy makers. One result of this is that the linguistic, political, and social characteristics of the capital and its environs are often assumed to be national.
2. Following from the first structural characteristic of decision making is the fact that the capital and its area are over-represented in the top ministry bureaucracy. Other regions are much less heavily represented. Rivalry among regions at lower levels in the ministry is often encountered. All ministry officials, no matter where their place of origin, become localized to the capital, buy a home there, view a move away from the capital as a demotion, and try to make powerful friends among the capitalinos. Culturally the capital is seen as the center and head of the nation. Even if other cities are more powerful economically or larger in population (as Guayaquil is in Ecuador) the cultural and political center is seen as the country's mainstream, attracting the country's energies to it. The primatial metropolitan see or main archbishopric is always in the capital and is usually headed by the country's only cardinal. Teachers, supervisors, principals from all regions come to the ministry in the capital to obtain decisions on even the most personal and minor matters. The political system is centralized in the same way, so education simply mirrors the political decision making system. The corridors of the ministry are usually jammed with applicants from all over the nation, and officials feel harrassed but suffer such petitions as part of their

work. The ministry officials have, as a result, little time to think about policy. Provincial capitals while having their own flavor are seen as divergent in values. The capital sets the norm for all educational values as a result.

3. Provincial educational authorities function as branches of the national ministry. They have no legal power of their own apart from the national function of education. Hence provincial inspectors, or superintendents, perceive their role as executing directives and policies from the capital. Few teachers bother the provincial offices for any decisions affecting their professional future. The ministry is the place where all go for the word. Supervisors function as national functionaries, executing what is perceived to be national policy vis a vis teachers.
4. Supervisors inspect schools and teachers. They do not assist, or serve as resource people. Supervisors are the ones who make decisions on teachers which affect their promotion to higher positions in the salary scale.
5. Selection of all administrative and supervisory personnel is at a national level, by concurso, or competitive processes. The qualifications do not include special professional formation or preparation. Tenure is the sole official criterion, as well as a record clean of problems (as viewed by supervisors). Political connections are important. The absence of professional preparation for supervisors leaves socialization as the sole force for role building. Supervisors are not viewed as subject matter or methodology experts. The teachers are at least their equals in professional skills. There is only very recently an attempt to provide some kind of training for supervisors in new roles.

6. Principals are selected at the national level with no local input into the decision. Principals have little authority other than to see that the building is opened, and that the few materials in existence are distributed. Community relations consist of forming a parents' group. Building maintenance, usually poor, depends upon the principal's initiative and relationship to the parents' group (padres de familia). The rare school with a hot lunch program has one because of the principal's relationship with the parents' group. Hot lunch, like building maintenance, is usually paid for by the parents group in cash or kind. Autonomy of professionals in the community is consequently high.

7. Teachers have a national organization which is effective in calling a strike, and has forced out an unpopular minister. It does not appear to be able to affect salary or promotion policy or educational policy in any but the most limited way. The occasion of a strike is most often the dismissal of teachers without cause or several payless months unexplained by the ministry. The teachers' organization is concerned with the bread and butter issues and seems not to affect policy on curriculum, materials, assignment, preparation, or certification.

8. The emphasis on inspection in the supervisor's role and the lack of materials leaves pupil control and presentation of material as the teacher behaviors which are rewarded. Classrooms are noisy places. Teachers use a very loud voice normally. Question and answer, either verbal or written, are nearly the sole method of interaction between teacher and pupils. Few pupils engage in the verbal question and answer process, leaving most pupils to exercise their physical and psychological need for activity in other ways.

9. The lack of resources for adequate classroom space and materials is striking. Simply housing all those children eligible for schooling in the first grade taxes the national resources available for schooling.

10. Reliable data on attendance, promotion, dropout, or achievement are hard to obtain. Reporting processes from local and provincial levels to the national level leave large margins of error in any figures reported. Standardized achievement instruments for national use are not available. Hence, any attempt to measure a reliable sample of learning behavior on a national scale requires the construction of instruments. The main data base is the teacher's register which is a compilation of all attendance, promotion, and achievement information. There is no standardized reporting procedure for teachers to follow.

11. Research and evaluation functions of the ministry are just being started. Such functions have almost no impact on provincial or local levels. The economic returns of education is a concept which is discussed mainly by officials of the presidency.

The Ecuadorean Ministry of Education decided upon a national textbook program in the mid-1960's. By 1967 a mission from a state university arrived in Ecuador to begin the technical work of assisting the ministry to prepare a six year program of primary grade texts and teacher guides in Reading, Mathematics, and Natural Science. A team of writers selected by the ministry began work after training in curriculum planning.

Teachers from selected normal schools served as advisers to the project, but met only infrequently. A set of textbook writers worked deductively from a extensive framework of objectives and content to write the textbooks.

Several types of cognitive objectives were included. Content was upgraded in accordance with the textbook writers' acquaintance with modern curriculum trends in other countries. For example, the first grade mathematics books are organized around modern mathematics concepts. The teachers' guide necessarily had to be a textbook in modern mathematics for the teacher as well as a guide to methodology for the teacher. Few elementary teachers had studied modern mathematics concepts, so they would have to learn the content along with the pedagogy. The teachers' guides for first grade reading, in 2 volumes, stressed the whole work approach over phonetics, but allowed for an eclectic approach. The whole word approach was a break with the normal school reading methods tradition. Few teachers had observed or used a whole word approach before the new textbook program began.

In the fall of 1970 the first textbooks were distributed in Ecuadorean classrooms. They cost 10 sucres each, which meant that each student would have to pay about $1.20 U.S. for the three textbooks. This was not a small amount by rural family standards. An average laborer's daily wages in the Sierra were somewhat less than that amount. Because of a high rate or repetition in grade, it is not unusual for two children of a poor family to be in the same first grade classroom.

Design of the Study

In 1970 the writer was asked to help the ministry of education plan an evaluation of the textbook program. A group of Ecuadorean educators planned the evaluation and carried it out. The design agreed upon was a pre-post test design with three types of treatment:

A. Classrooms with the new textbooks, guides and orientation to teachers in the new textbook programs.

B. Classrooms with new textbooks and guides but with no orientation to teachers.

C. Classrooms with other textbooks, or none, and no orientation to teachers.

The design could be called field experimental with treatments assigned to particular schools but modified by many variables which could not be controlled. No other conditions were controlled in the classroom than use of textbook and teacher guides.

The following comparisons were also made:

1. The means of pre tests and post tests were compared to determine whether there were differences in achievement between the first grades of urban and rural schools. These comparisons were made for the Sierra, Coast, and both sections combined. The purpose of these comparisons was to determine whether the rural schools were more equal to urban schools in achievement gain. More unlicensed teachers are assigned to rural schools than to urban schools. Rural students do not have such extensive verbal experiences as urban students.

2. The means for pre tests and post tests were compared to determine whether differences existed in gains between graded, multi-graded, and ungraded schools. A multi-graded school is a "pluridocente" or one in which a teacher has responsibility for more than one grade. All ungraded schools and most multi-graded schools were located in rural areas. Most graded schools were located in urban areas and all urban schools were graded. Hence there was some overlap between the classification for type of school and urban-rural location. The ministry expected better results from graded schools. These comparisons were made for Sierra, Coast, and combined sections.

3. The most important comparisons of pre and post test scores were for the three field-experimental conditions referred to above and which will be called A, B, and C. Separate analyses were made for Sierra, Coast, and combined sections.

4. Verbal behavior was observed in classrooms. Comparisons of teacher-pupil verbal interactions in the classrooms were made using the Ribble Social-Substantive Schedule. Three measures of teacher verbal behavior, total number of years teaching, and number of years teaching experience in the first grade were used to predict raw gain in 33 selected schools of the 72 in this study. It was not possible to make the observations in all the schools of the study due to the small number of observers. This type of analysis was employed to determine whether teachers differed in verbal behavior according to their use of textbooks. One of the purposes of the textbook program was to change teaching behaviors in the classroom.

5. Data on textbook use such as median number of pages completed for each subject, teacher comments, and supervisors' comments concerning the texts were gathered.

The national primary supervisors were brought together and given orientation so they in turn could orient the teachers in the type "A" schools. The primary supervisors were also supposed to see that first grade teachers assigned to the study were actually keeping to one of the three conditions to which they were assigned.

The Ecuadorean team constructed three standardized tests of knowledge in reading, mathematics and natural science. Different forms were constructed for the Coast and Sierra portions of the country. The two forms were correlated to determine alternate forms reliability, which exceeded .75 in a sample of over 100 children. Test-retest reliability was established for all

tests, with .82 or higher correlations being attained within periods of 2 weeks. Each item used in the tests discriminated in favor of the upper 27% who took the tests during the period of development.

Beginning with October, 1971, pre tests were administered in the Sierra schools, followed by post tests in the spring of 1972, 6 months later. The three tests were administered in the schools of the Coast in July, 1972, with the post tests applied in November and December, 1972. The testing followed the schedules of Ecuador's two different school years for Coast and Sierra regions.

Children enter the first grade of Ecuador's primary schools at the age of six. Schools have widely varying percentages of six year olds in the first grades, depending upon local promotion policy. It is against the law to force a child to repeat grade one simply to master the content of that grade. Nevertheless, retention is common, but emphasis on repetition differs from one province to another. The province of Loja in the Sierra had the highest repetition rate (29.4%) in the country for 1971-72. Loja is a largely rural province in southern Ecuador, newly famous for its village of Vilcabamba which has so many centenarians. The next highest repetition rate in the first grade was found in the Coastal province of Manabi (22.8%) in 1972. Both provinces were in the study.

A random sample of 72 schools from 4 randomly chosen Sierra provinces was chosen and the schools were assigned by random selection to one of 3 conditions. The sample of 72 Sierra schools had to be limited to 52 after it was learned that many supervisors were not visiting 20 assigned schools, despite the orders of the subsecretary of the ministry to do so. Pre tests were administered to the 72 schools. The pre test data for the 52 remaining schools did not differ significantly from the 20 schools which had to be dropped.

The 52 schools of the Sierra in the final sample came from four provinces and in which one of the three assigned conditions was actually followed. The supervisors who refused to monitor conditions or orient teachers did so without fear of punishment.

The selection of 36 schools in the Coastal area followed the same procedure as in the Sierra. Two provinces were selected from all the Coastal provinces by random procedures. Eighteen schools were selected from each type (graded, multi-graded, and ungraded). Twelve Coastal schools were assigned by random procedures to each of the three field treatments. The population of Coast and Sierra are nearly equal, so there is more sampling error in the 36 schools of the Coast than in the 52 schools of the Sierra. The experience with the Sierra supervisors made it necessary to take precautions with the observation of the three types of field-experimental conditions and the orientation of the teachers. Better cooperation was provided by the supervisors in the Coastal section so it was not necessary to drop any of those schools.

The sample of classrooms were distributed as follows among section, location, type, and condition:

Distribution of Schools by Section and Location

	Section		
Location	Coast	Sierra	Total
Urban	10	14	24
Rural	26	38	64
Total	36	52	88

Distribution of Schools by Section and Type

Type	Section: Coast	Sierra	Total
Graded	12	20	32
Multi-Graded	12	15	27
Ungraded	12	17	29
Total	36	52	88

Distribution of Schools by Section and Field-Experimental Condition

Field Condition	Coast	Sierra	Total
A	12	19	31
B	12	15	27
C	12	18	30
Total	36	52	88

The representation of location and types of schools in the sample reflects fairly closely the proportion of all such schools in Ecuador. Less than one third of the schools are urban, but urban schools have much larger enrollments. Slightly more than one-third of the schools are graded, and they, too, have larger enrollments than multi-or non-graded schools. The Sierra provinces represented in the study were Chimborazo, heavily rural and Indian, Imbabura, mostly rural, half Indian and half Mestizo. The Coastal provinces were Guayas, where the largest city is located and which is entirely Mestizo, and Manabi which is mostly rural and entirely Mestizo.

Findings

1. Nine comparisons of pre and post test scores were made for urban vs. rural classrooms. They were in reading, mathematics and natural science for Coast, for Sierra, and for combined Coast and Sierra sections. A Lindquist Type I Analysis of Variance design was used to determine significance for each of the nine comparisons. Each comparison tested the pre and post test means by urban and rural, and the interaction between pre and post and urban-rural classifications. In only one subject area, reading, for combined rural and urban classrooms was there a significant interaction. That significant interaction was a result of larger gains in reading for urban than for rural classrooms. Post test scores were all significantly higher than pre test scores.

2. Types of schools were compared in three subject matter areas for Coast, Sierra, and combined section schools. The Lindquist Type I analysis of variance design yielded several significant differences between school types. These results are summarized in the following table.

Table 1

Comparison of Gains in Three Types of Schools: Graded (G), Multi-graded (M), and Ungraded (U) in Coast and Sierra and Combined Sections

Coast	G = M = U	G = U > M*	G = M = U
Sierra	G > M = U* (I**)	G = M = U	G > M = U*
Combined Coast and Sierra	G > M = U* (I**)	G = M = U	G = M = U

* F ratio significant at .05 level

** F ratio significant at .01 level

I** F ratio for interaction significant at .01 level

Graded classrooms had greater gains than multi-graded classrooms and in three out of 4 cases where differences appeared, over ungraded schools. Such differences might be expected because graded (or Completa) schools where a teacher who had responsibility for only one grade could spend more time on each subject. It is possible, too, since most graded schools were urban, or near urban areas, that more experienced and better prepared teachers were assigned to such schools, as in the case of the urban-rural comparisons the pre test scores were significantly lower than the post test scores in the three subjects.

3. The most important comparisons were the three field experimental conditions in each of the three subjects. Only one out of nine comparisons was significant between field experimental conditions. In reading the classrooms with new texts and teacher orientation (Type A) and those classrooms using other or no texts (Type C) had greater gains than classrooms where new texts were used without teacher orientation (Type B). These results were not impressive for those schools using new texts with teacher orientation. One might say that this is another of many examples showing null differences among experimental conditions because of limited definition of experimental treatment and the multiplicity of uncontrolled variables. Surely all such criticisms are in order. A summative evaluation may be inappropriate for analyzing the effectiveness of texts. This writer would agree, however, that achievement gain is an important and appropriate criterion variable to use in evaluating the effectiveness of a textbook program if the ministry has this as a concern. Give more orientation to the texts and guides should give teachers who have that orientation more advantage in stimulating greater pupil achievement gain.

A study of reading comprehension in fifteen countries, completed in 1973, reported a range of zero order correlations from .35 to -.16 between the percent of teachers reporting that each student had access to his own textbook and achievement. The median correlation was .02. The range of partial correlations, holding Father's occupation constant, for the fifteen countries was .34 to -.20 with a median of -.02. (Thorndike, pp. 101-110). The results are no more impressive than these reported in this study.

4. There was an impressive gain in the first grade in all three subjects. Coast and Sierra differences in gain bear mentioning, too.

The first discussion concerns gains between pre and post test administrations. The achievement tests used in the three subjects all were 50 item tests. The following tables show gain results in combined Coast and Sierra schools for three kinds of comparisons used in the study. Table 2 shows mean comparisons by urban and rural, Table 3 shows comparisons of means by field experimental conditions, and Table 4 shows comparisons by type of school.

Table 2

Pre Test and Post Test Means and Differences
By Location for Reading, Mathematics and
Natural Science for 88 Coast and Sierra Schools[1]

	Pre Test Means	Post Test Means	Difference between Pre and Post Test Means
Reading Urban	13.75	32.05	18.30**
Reading Rural	14.41	28.66	14.25**
Mathematics Urban	7.86	19.74	11.88**
Mathematics Rural	7.54	20.30	12.76**
Science Urban	11.75	21.34	9.59**
Science Rural	11.05	20.74	9.69**

[1]Numbers indicate items completed correctly

** Difference significant at .01 level.

Table 3

Pre Test and Post Test Means and Differences By Field Experimental Condition for Reading, Mathematics and Natural Science for 88 Coast and Sierra Schools[1]

	Pre Test Mean	Post Test Mean	Differences Between Pre and Post Test Means
Reading Condition A	15.16	30.25	15.09**
Reading Condition B	13.10	28.66	15.56**
Reading Condition C	14.28	29.70	15.42**
Math Condition A	7.34	20.07	12.73**
Math Condition B	7.87	20.61	12.74**
Math Condition C	7.70	19.81	12.11**
Natural Science Condition A	11.23	21.10	9.87**
Natural Science Condition B	11.23	21.16	9.93**
Natural Science Condition C	11.27	20.47	9.20**

[1] Numbers indicate items completed correctly.

** Difference significant at .01 level.

Table 4

Pre Test and Post Test Means and Differences by Type of School in Reading, Mathematics, and Natural Science[1] for 87 Coast and Sierra Schools

	Pre Test Mean	Post Test Mean	Difference from Pre to Post Test
Reading Graded	13.75	32.71	18.96**
Reading Multi-Graded	13.31	26.97	13.66**
Reading Ungraded	15.62	28.57	12.95**
Mathematics Graded	7.48	20.32	12.84**
Mathematics Multi-Graded	7.35	19.47	12.12**
Mathematics Ungraded	8.04	20.60	12.56**
Natural Science Graded	11.21	20.81	9.60**
Natural Science Multi-Graded	11.90	21.33	9.43**
Natural Science Ungraded	10.67	20.61	9.94**

[1] Numbers indicate items completed correctly.

** Difference significant at .01 level.

All comparisons between pre and post test means revealed highly significant differences over the 6 to 7 month period. There were no comparisons made between the subjects to see which gains were the greatest, but it seemed that the greatest differences were in reading, the least in science, with mathematics second in strength. That coincided with an informal appraisal of the importance of subjects as seen by the teachers. All teachers volunteered that reading was most important, followed by mathematics, with science third in importance and far behind the two skill areas. These findings appear to verify that ranking.

The hypothesis that schools do not make a difference would seem to be rejected in Ecuador. The Coleman report attributed more importance to school factors for lower income students than for middle class. School factors explained a greater percentage of achievement of poor children than of middle class children. The schools in this study were fiscal, or federally supported, public schools. The schools of Ecuador are class stratified. The public fiscal schools are nearly entirely attended by the children of the poor. Some annexas, or experimental schools affiliated with normal schools, are attended by lower middle class children. The middle class, including most of the lower middle class, sends its children to private schools. Among the expenses which loom largest for lower middle class families is that of paying the tuition for private education. Many private schools are religious. Religious schools often have special night sections free for poor people's children, but that attendance is an insignificant percentage of all children of the poor who attend school. Municipal schools, those supported partly by local and partly by federal funds, serve a clientele which is mostly of the lower economic class, with perhaps a shade higher

percentage of lower middle class children in attendance. By far the most numerous schools in Ecuador are the fiscal schools. with by far the largest enrollment.

Gains in achievement in this study, then, reflect largely the gain of poor children. In the urban classrooms of the sample, one would find a small number of lower middle class students. The Ilich hypothesis, if one can refer to his assertions as a hypothesis, is that schools do not help poor children. The data free judgements of Ilich would appear to be out of phase with the reality at least of achievement in Ecuador's schools. His assertions about segregation of schools into class system are all too true for Ecuador. Whether the remedy for that is less schooling, or none, is not to be pursued in this paper. The value of first grade schooling can hardly be denied by these data, however.

Schools do make a difference for the first grade children. Comparable data are now being gathered for the private schools in another national study. It would be difficult to imagine that Ecuador's first grade children who must attend fiscal schools would do as well by not attending school. Attendance at fiscal schools may not allow them entrance to pre-professional curricula in secondary schools. But those who attend school have an incomparably better preparation for some productive role in the economy than those who attend no school. Those who do not attend school, and their numbers are large, cannot hope for anything other than the most menial kinds of labor. Perhaps informal kinds of schooling can be devised for those who until now have not had a chance for schooling. But there are not now extensive means for children not in school to learn how to read. School reform is and must be a continuing effort if poor people get to be helped realize better economic conditions.

One set of comparisons is sufficient to illustrate the point that Coast children started at a higher point and gained about the same raw amount in mathematics and science. In reading the Coast children started ahead but gained considerably less and finished behind the Serranos. None of these comparisons have been treated for significance because of policy reasons. Rivalry between Coast Sierra is extreme in political and professional matters. The Sierra people have a different pronunciation pattern than the Coastal people. The Coast excels in business and commerce, while the Sierra is the cultural and political capitol of the country. Repetition rate differences by section and province do not account for this phenomenon. The school years are different--the testing began in the Sierra in fall of 1971 and in the Coast in spring of 1972, but the ages of entry into first grade do not differ between Coast and Sierra. Differences between test forms would not seem to account for so much of the differences since the alternate forms reliability was sufficiently high to reject that as a possibility. The standard of living and per capita income on the Coast are higher on the Coast than in the Sierra. These regional differences can only be held as tentative until further data emerge. The regional differences were not a major concern of the study but do suggest the need for more study in the national analysis of primary education now underway. Table 5 shows subject matter gain by Coast and Sierra sections.

Table 5

Comparisons of Pre and Post Test Scores
Between Coast and Sierra First Grade Classrooms
By Location in Three Subjects

	Coast			Sierra		
	Pre	Post	Number of Schools	Pre	Post	Number of Schools
Reading Urban and Rural	17.76	27.62	36	11.78	30.94	52
Math Urban and Rural	12.88	27.31	36	3.99	15.19	52
Natural Science Urban and Rural	16.27	28.41	36	7.91	16.01	51

Forty-three of 88 teachers reported the number of pages completed in the 3 texts. The median pages completed as reported by teachers is reported in the following table:

Table 6

Median Pages Completed in
New Textbooks, According to Teacher Report
in Coast and Sierra Schools

Schools	Reading	Mathematics	Science
Coast	74	102	71
Sierra	130	140	102
Condition A	103	122	93
Condition B	92	126	93
All Schools	100	123	93
Total Number of Pages in Text	170	217	134

Interestingly, teachers of the Coast classrooms reported a much lower number of pages completed in mathematics and science, even though pupils

in those schools completed more of the items in the tests. The tests were constructed using a sample of items from the new textbooks and from the older texts commonly used in the first grade classrooms. Sierra teachers reported using much more of the reading text than the Coast teachers. The medians for all teachers who reported were somewhat over half of the reading and mathematics texts and about 2/3 of the science text. Since a relatively small portion of the texts was used one question which necessarily arises is how the students being promoted to the second grade will be ready for the texts graded for the second grade reading and mathematics classes. The science text was written not as a text with sequential material, so much as a combination of resource units. The necessity of revising the texts into smaller learning packages is apparent if they are to be useful for the first grade. The most frequent positive comments of the teachers on the texts were that they were interesting and stimulated curiosity, unified the country's curriculum, appeared to be Ecuadorean in content, were considered attractive, alternative, developed needed skills, and used psychological principles. The most frequent negative comments on the texts were that they were too long, too difficult for students to understand, covered too much material for the (rural) ungraded and multi-graded schools, that the vocabulary was not correlated between the texts, and that they required too much auxiliary material.

Classroom Observation Data

Ribble and Schultz designed an observation schedule with twelve categories of verbal behavior. The schedule was translated into Spanish in 1971 and the Ecuadorean team was trained in the use of the instrument early in 1972. Inter-observer reliability was established and from March to December, 1972, observations were made in 33 schools (16 in the Sierra, 17 on the Coast) which were part of the larger sample.

Categories A through H are teacher verbal behaviors, while Categories I through L are student verbal behaviors. Teacher category F is neutral--not directed toward any particular objective or learning activity. Category L is neutral as well, not directed toward any specific objective. Categories F and L are not used in the analyses as they could be termed "waste-basket" categories, including random activity, confusion, noise, and personal matters.

The evaluation team members made tape recordings of all of their classroom visits. So each member had a taped record as well as a written record of each classroom visit. Upon returning to their Quitc offices from the field observations, the team members played the tapes and at least two, often three, members listened to each tape, categorizing each verbal behavior. The agreement between the observers ranged from .85-.95, with a median reliability of .88. The data recorded are actually a consensus arrived at between the observers as to how the verbal behaviors should be classified whenever there was less than full agreement.

The Social Substantive data were used to determine if the teacher-pupil verbal behavior correlated with:

1. Total years of teaching.
2. Years of teaching in the first grade.
3. Raw gain in each subject matter, i.e., reading, mathematics, and science.

A regression analysis was used employing predictors of raw gain. The criterion selected was subject matter gain from pre test to post test. This is called raw gain, because the gain is not manipulated statistically. Raw gain was used in the analyses of variance in the comparisons made earlier in the study.

The criterion of gain was predicted by the following variables, using each classroom as the unit of analysis, with the following factors predicting pupil gain:

1. total number of years teaching,
2. number of years teaching in the first grade,
3. Social Substantive measure 1;

$$\frac{A + B + C + D + E}{A + B + C + D + E + G + H}$$

4. Social Substantive measure 2;

$$\frac{A + B + C + D + E + G + H}{A + B + C + D + E + G + H + I + J + K}$$

5. Social Substantive measure 3;

$$D + K$$

Social Substantive Measure 1 is a ratio teacher support of learner behavior (A + B + C + D + E) to teacher support plus teacher dominance (A + B + C + D + E + G + H). It is a ratio of supportive behavior to a total of supportive plus dominating behavior. The higher the ratio, the more supportive behavior is being employed by the teacher. The lower this ratio, the more the pattern is one of teacher dominance.

Social Substantive measure 2 is a ratio of teacher talk (A + B + C + D + E + G + H) to teacher talk plus student talk (A + B + C + D + E + G + H + I + J + K). The higher the ratio, the higher the amount of teacher talk in the classroom. The lower this ratio, the more student talk is observed in the classroom.

Social Substantive Measure 3 is a summation of categories D and K. These two behaviors include a teacher behavior (D) which is "examination" or a type of inquiry addressed to a student once a student has volunteered, and a student

behavior (K) which is "pursuing." The teacher puts a question to the group and an individual replies voluntarily. The interchange between teacher and pupil is then styled a "D" (teacher asking for more clarification) and "K" (student responding voluntarily). The combination of the two behaviors provides a measure of "examination mode," or "guided discovery." If the percentage of D and K together exceeds 20% the verbal mode of the classroom may be styled "examination mode." The verbal behavior of only three of the classrooms would have been styled close to "examination mode" according to the findings. The three classrooms were those in which the evaluators found more than one subject in which D and K together constituted close to 20% of the total behaviors. The teacher who is simply asking questions in a lecture recitation mode is classified G (teacher asking a question) followed by I (student responding). This is a different mode of question-response than D-K.

The Social Substantive schedule can also be used to classify verbal behavior according to Traditional and Modern Categories, with 3 points in each of the 2 categories. Lecture-Recitation is a traditional mode. Examination and open exploration constitute the modern modes.

No significant correlations were found between each of the three Social Substantive Schedule measures or years of experience, and reading gain. Nor were significant correlations found between each of the three Social Substantive measures and mathematics gain.

The amount of reading gain in the 33 schools correlated significantly with gain in science (.61). In science classes more significant correlations emerged. Science gain was highly correlated with Social Substantive Measure 3 which is a verbal exploration ("what do you mean by that; Explain that, please"). Social Substantive Measure 1 (the ratio of supportive verbal behaviors to supportive plus directive behaviors) correlated negatively with

a teacher's experience in grade one. This correlation indicated that the lower the ratio (or the less supportive behavior is used) the longer a teacher has served in the first grade. Social Substantive Measure 2 (ratio of teacher verbal behavior to all verbal behavior observed in the classroom) was significantly correlated to Social Substantive Measure 1. These three correlations pertain to Science classes, where teachers had the least preparation, which they estimated to be third in importance after reading and mathematics, but was the most flexible textbook material of the three programs. Perhaps the less a teacher in Ecuador is prepared and the less experience he has the less he feels monitored, the more innovative he will be.

Table 7

Selected Pearson Product Moment Correlations for Social Substantive Measures and Experiences in 32 Schools

	Total Years Service	Years in Grade 1	Social Substantive 1	Social Substantive 2	Social Substantive 3
Science Gain	.024	.012	-.201	-.111	.359^{x}
Total Years Service		.228	-.325	-.262	.193
Years in Grade 1			-.363^{xx}	-.173	-.066
Social Substantive 1				.581^{xxx}	.023
Social Substantive 2					-.204

x Significant at .05 level
xx Significant at .01 level
xxx Significant at .001 level

Teachers all taught the three subjects. This provided an opportunity to measure the consistency in verbal behavior between one subject and another. Teachers were highly consistent in their verbal behavior from one subject to another in spite of a limited repertoire of verbal behavior. Correlations between mathematics and reading classes and between science and reading classes were highly significant, using Social Substantive Measure 1.

Table 8

Social Substantive Schedule 1

Intercorrelations[1]

	Social Substantive 1 Math	Social Substantive 1 Science
Social Substantive 1 Reading	.443 x	.351 x
Social Substantive 1 Math		.123

x Significant at .05 level
xx Significant at .01 level

[1]Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

Using Social Substantive measure 2, significant correlations were found between mathematics and reading classes, and between science and mathematics classes.

Table 9

Social Substantive Schedule 2

Intercorrelations[1]

	Social Substantive 2 Math	Social Substantive 2 Science
Social Substantive 2 Reading	.470 xx	.255
Social Substantive 2 Math		.429 x

x Significant at .05 level
xx Significant at .01 level

[1]Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

Teacher examination behavior (Social Substantive Measure 3) was significantly correlated between mathematics and reading, science and reading, and science and mathematics.

Table 10

Social Substantive Schedule 3

Intercorrelations[1]

	Social Substantive 3 Math	Social Substantive 3 Science
Social Substantive 3 Reading	.501 xx	.779 xxx
Social Substantive 3 Math		.634 xxx

x Significant at .05 level
xx Significant at .01 level
xxx Significant at .001 level

[1]Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

Multiple correlations using the five predictors of teacher experience in teaching, teacher experience in the first grade, and the three S.S. measures for gain in each of three subject matter areas were computed. The combination of predictors accounted for 10% of the gain in reading, 16% of the gain in mathematics and 20% of the gain in science. The regression program was modified to allow each variable to be forced into the regression. Each predictor was treated in this regression as a linear variable.

Table 11

Multiple Regression Data:
Five Predictors, Using Linear Relationships,
for Subject Matter Gain[1]

	Multiple Correlation	Percentage of Variance Explained by Five Predictors
Reading Gain	.319	10%
Mathematics Gain	.399	16%
Science Gain	.447	20%

[1]Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

The significant relationship between science gain and Social Substantive Measure 3 contributed powerfully to the multiple correlation for science. The negative relationship between Social Substantive Measure 2 and mathematics gain contributed heavily to the multiple correlation for mathematics gain.

In summary, years of experience contributed little to gain. Only in science did teacher verbal behavior seem to be correlated to gain. Perhaps this happened because of the lack of structure in preparing teachers to teach

science, and the more freedom teachers have, the more they will allow students to talk. Teacher verbal styles were consistent across subject matter. The explanation of variance in gains was small for the three subject areas, but smallest of all for reading. Other variables such as intelligence, family help and encouragement, and such as socio-economic factors may account more powerfully for gain than did the variables selected in this study.

Other comparisons using the three Social Substantive measures were made between location, type of school, and field experimental condition. No differences appeared between rural and urban schools. Using type of school, only one comparison out of nine was significant: the ratio of teacher talk to all talk in the classroom was higher for reading in one room (ungraded) schools than in multi-graded or graded schools.

No differences in teacher verbal behavior were found grouping schools by field experimental condition (A, B, C). So teacher verbal behavior did not vary with use of textbook.

The multiple regression formula used in the preceding discussions employed linear relationships. The analysis of certain relationships revealed the possibility that curvilinear rather than linear relationships better described those pairs of variables. The regression of each predictor variable on gain was analyzed by examining the curve of the variable on low, medium, and high gain groups.

For example the reading gain was poorly explained using the three Social Substantive and two experience variables. The linear relationship between Social Substantive 2 and reading gain is .03, while the curvilinear relationship is .23. After each linear relationship was examined, the multiple R using the five predictor variables was computed, using the curvilinear relationships which were higher than the linear relationships.

The linear relationship between reading gain and Social Substantive 3 was .11 and the curvilinear relationship was .13.

Using linear forms the multiple R for five predictor variables and reading gain was .32. Using curvilinear relationships for Social Substantive Measures 2 and 3, and keeping linear relationships for both experience variables and Social Substantive Measure 1, increased the multiple R to .47. In explanation of reading gain, using the 2 curvilinear variables, with the 3 linear, the increase of predictability was from .10 to .22.

In mathematics gain, each predictor variable was analyzed using analysis of variance. The slope of years experience in grade 1 on math gain showed fewer years of experience for the middle gain group than for the lower and upper groups. A curvilinear relationship was higher (.13) than the linear relationship (.11). There was a higher ratio using Social Substantive Measure 1 for the middle than the lower and high groups on math gain; the curvilinear relationship (.33) was higher than the linear (.12). A curvilinear relationship (.06) better described the relationship between Social Substantive Measure 3 and math gain than a linear relationship (.01), because the middle group on math gain had a higher ratio than the low or high groups.

Entering these three curvilinear relationships with linear relationships for total years experience and Social Substantive Measure 2 into the multiple regression program, a multiple R of .55 was obtained. The proportion of math gain explained rose from .16 to .30.

The relationship of science gain to the five predictor variables was examined. The curvilinear relationship of total years experience of teachers to science gain was .19, compared to a linear relationship of .02. The curvilinear relationship of years experience in the first grade to science

gain was .05 compared to a linear relationship of .01. Social Substantive Measure 2 had a curvilinear relationship of .11 to science gain which was the same as the linear relationship.

Entering the three curvilinear relationships into the multiple regression formula, and preserving the two linear relationships for Social Substantive Measures 1 and 3 yielded a multiple R of .448 compared to the previous multiple R of .447. The resulting gain of predictability of .001 or .1% is of little consequence.

Table 12 shows the multiple correlations using the curvilinear relationships identified in the foregoing discussions as higher than the linear relationships in the earlier multiple correlation.

Table 12

Multiple Regression Data

Five Predictors, using selected Curvilinear Relationships, for Subject Matter Gain[1]

	Multiple Correlations, Using Selected Curvilinear Relationships	Percentage of Variance Explained By Five Predictors
Reading Gain	.471	22%
Mathematics Gain	.550	30%
Science Gain	.448	20%

[1]Reading and Mathematics observations were taken in 33 schools, science observations were taken in 32 schools.

The multiple correlation using only linear correlation resulted in the highest predictive power for science gain. Using curvilinear relationships where appropriate, the explanation of mathematics gain is highest, and of science gain is lowest, using the five predictors in this study. Using curvilinear relationships resulted in considerably higher predictive power of the five variables for mathematics and reading gain. For mathematics gain the increase was largely due to the curvilinear relationship between S.S. Measure 1 and gain. S. S. 1 is the teacher support ratio. The increase in the multiple R for reading gain was largely due to the curvilinear relationship of S.S. Measure 2 and reading gain. S. S. Measure 2 is the teacher domination ratio.

Discussion

The choice of design in this case as a modified field experimental design was made by a group of Ecuadorean ministry officials. It was ambitious and required a sample of schools which turned out to be too large to control at first with the resources available. The observations of the treatments in the schools required more observers than were available and so the number of schools had to be reduced if the design were to be kept intact. A field experimental design is effective only for the number of schools where the treatments can be strictly monitored.

The null findings between treatments might lead one to conclude that a field experiment using different treatments is not appropriate, at least for comparing results of textbooks. However, differences were found in learning gain according to type of school. The use of this type of design has been criticized recently by Charters and Jones (1973).

They point out that a design of an evaluation study using experimental and control groups is misleading in that certain kinds of changes in a

classroom are ignored in the attempt to identify certain desired outcomes. The attempt to identify only achievement as an outcome would in this study mask certain other kinds of desired outcomes.

They suggest that variables in the change process be identified by certain levels. The levels are:

1. Institutional committment. This is an official specification of what is to happen, as the "formal doctrine" of Smith and Keith. In the Ecuadorean study of textbook use, certainly there was an official committment, specified by the ministry, to the use of the new textbooks.
2. Structural Context. The structural alterations for facilitating adoption include features such as assignment of committees, assigning responsibilities, purchasing materials, and stating directives. Structural changes in Ecuador to facilitate changes included the organization of a textbook department, provision for distributing the new textbooks, and the appointment of an evaluation committee for reviewing textbook use.
3. Role performance of staff. The observation of actual degree of use of the new materials is included in this level. Behavioral adaptations by teachers of the new materials are also part of this level. The degree of use by teachers varied as part of the field experiment, so this was really built into the study.
4. Learning activities by students. This is the most difficult level to achieve as it requires the teachers to provide new kinds of learning experiences for the students. The ministry provided a retraining program for teachers so that they would put into effect how activities for students suggested by the teacher guides. The

retraining and the availability of guides would presumably accomplish this level.

From the view of the evaluation model suggested by Charters and Jones, the new textbook input satisfied three of the four level criteria, and provided for accomplishment of the fourth and highest level. The change in learner behavior would be a desired result of the fourth level of analysis. It could certainly be argued that one year of use of the textbook program is not a sufficient time to observe such a behavioral change in students. In a sense, the expectation of student learning change is a bonus to be expected once the criteria levels of change have been satisfied.

The use of achievement change as a criterion is defensible only if the goal of a program is to secure change in achievement, either in quality or quantity. Clearly the ministry must have had some concern for this dimension of change. To observe that a textbook program is a failure because of a null finding between users and non users is not an exhaustive statement, although it may be technically correct. The author of this paper does not intend to use exclusively such a simple criterion of effectiveness but rather to include the achievement criterion among others. Unquestionably the ministry of education provided policy, structural and role changes necessary to facilitate adoption.

It was the intention of this paper to study certain conditions in the educational system and the exogenous system which affected the change. The textbook program interacted with so many complex variables in the structure and role functions of the system that the productivity variable alone should not distract an evaluation study from other system variables.

One reason that no differences appeared between treatments may have been the lack of training of the teachers who used the new textbooks and guides.

Simply having the new textbook program and receiving orientation was not enough. Training in the use of the texts and in new kinds of teaching behavior other than presenting material and testing for it would seem to be necessary if the texts are to have the desired effects on the nation's classrooms. Gain in cognitive learning was measured, and gain in non-cognitive learning was not measured.

In 1973 an effort to retrain the first grade teachers was begun so that there indeed would be some difference in the teaching behavior and hopefully learning in classrooms. This evaluation helped the ministry decide on the retraining of all first grade teachers.

The more experience teachers have in using a text and guide program the more success they will presumably have in assisting student learning. The observation of their behavior in classrooms over three years time would seem to be a more precise way of estimating the effectiveness of the program. This presumes that the teachers in such schools would change. Some observation of the student abilities would also have to be made as well, because with rapidly increasing communication and transportation, the non-school learning taking place in Ecuador can be expected to increase rapidly as the nation's wealth increases.

The comparisons using type of school resulted in more differences between pre and post tests than the locality of the school. Even though all ungraded schools were rural and most urban schools were graded, the type of school differed more than the locality.

Pre test differences between urban and rural schools were not subjected to tests of significance, but in all cases it appeared that pre tests means in urban classrooms were greater than in rural classrooms. Pre-post differences

were examined in the design and these differences between urban and rural were not significant.

Attempts were not made to stress differences between Coast and Sierra, although it appeared that Coast students were higher in mathematics and science than the Sierra students. The Sierra students appeared to gain more in reading over a comparable six months period of time.

The power of the supervisor was apparent in the necessity to drop some schools from the sample, because many supervisors simply did not visit the schools assigned them despite orders to do so from the Subsecretary of the Ministry. The supervisors have great influence over the teachers. They recommend advances on the salary scale, and above all, transfers which to the isolated young rural teacher means being near other young people of the same class and living in incomparably better conditions, as well as having a far better teaching situation. Rare is the teacher who would dare ignore a suggestion from a supervisor concerning the use of a textbook--even though that teacher might know the new textbook was better than what the supervisor recommended.

Although supervisors were oriented to them, few appeared to like the new textbooks. Some supervisors freely criticized the texts for emphasizing changed methods. To be sure, the supervisors were better judges of the pace of change and obstacles to change than the new ministry textbook writers and promoters were, and since they controlled the rewards in the field, the teachers listened carefully to the supervisors.

The textbook program is an example of a change brought about at the top level of an educational bureaucracy. The top level of the bureaucracy attempted by means of introducing a new resource to change teacher behavior. At the time of this evaluation it hoped that adoption of a new nationwide

textbook program would succeed in changing teacher behavior. The ministry decided that it would have to go to the teacher to assist the teacher in clarifying the objectives of the textbook programs and in defining how teachers ought to change their behavior. There remained the step of convincing those who administered the rewards of the system--the national supervisors. In the fall of 1973, the ministry began a program of orienting the supervisors to the new textbook programs. But the orientation had to be different than the one-week sessions of prior years. This time a group of supervisors was chosen to go to the U.S. for training, and to return as a group of trainers of other supervisors.

Change in behavior begins with the introduction of new materials provided plenty of cues and rewards are supplied with the new materials. It comes possibly with involving teachers in identifying ways they might use the new materials. Teachers' change in verbal behavior was observed, but other kinds of changes in teacher behavior will need to be observed as well.

Change in an educational system can easily be blocked or retarded by middle level administrators. They must be convinced and rewarded to change their ideas. If they feel they are ignored they will refuse to cooperate and by so doing they can as effectively retard change as effectively the upper levels can promote it. Teachers in a national system listen to those who they know command rewards and penalties. They will attend to those officials closest to them who appear powerful, even when they hear a different message from higher levels.

Teachers underutilize new materials. Without intensive training they use new materials like they used old materials even though the instructions tell them differently.

The adoption of a textbook program is an example of the application of a technology in a system whose cultural norms were those of a non-scientific system. The adoption of a technology by a system hitherto unprepared results in dysfunctions which appear unexpectedly but which can be explained by various theories.

One such theory which explains the adoption phase of the textbook program is McGregor's Theory X and Theory Y (1960). The textbook program implementation followed the theory X assumptions:

1. Human beings dislike work and will avoid it if possible.
2. Because of the above most people must be moved, controlled and directed to put forth the effort toward achievement of organizational objectives.
3. Human beings prefer direction and security, avoiding responsibility and ambition.

A management based upon these assumptions provides for physiological and safety needs. Once basic security is provided, rewards are added which motivate an employee to do what management desires. Social needs are largely ignored in this scheme of management. Applying McGregor's theory to this study we hypothesize that supplying a needed tool (the textbook) becomes a reward. A basic reward to be sure, since most teachers didn't have such a tool. It was assumed that satisfying such a basic tool would automatically result in its acceptance. Egoistic and social needs were unrecognized as existing in the system. The adoption of the texts was ordered at the highest levels of the ministry. An order went out to distribute and use the texts. It was assumed they would be used. The supervisors would monitor the evaluation as they were ordered. The use of the tool would change all kinds of teacher behavior. The flint for lighting the fire of educational reform

was at hand. But the production of a textbook program is not the adoption cycle. Production decisions are more simple in human relations and change terms than the behaviors of the adoption cycle.

Theory Y in contrast, presupposes that:

1. Work is as natural as play and rest.
2. External controls are not the only means of bringing about organizational objectives. Human beings have self control which they exert toward those objectives.
3. Rewards stimulate the committment to objectives.
4. Human beings accept and, under proper conditions, seek responsibility.
5. A capacity to exercise a high degree of imagination and creativity is widespread in the population.
6. In modern society the human being's potential is only partially utilized.

This optimistic set of assumptions leads to a necessity for management to involve members of the organization; involvement will rule creativity. The assumptions in the ministry included some Theory Y assumptions. These were that a new textbook program would be used imaginatively once it was adopted. Little thought was given before the production cycle was completed to the adoption cycle. A textbook program having as its intent the change of teacher behavior presupposes creative adaptation as part of the adoption cycle. Creative adaptation requires careful study and understanding of the texts and guides, a desire to implement the teaching strategies mentioned (such as formation of small groups, student inquiry, and pragmatic approaches to word attack skills), and imagination in the application of the ideas presented in the guides (such as use of locally produced instructional materials if manufactured ones aren't available). The adoption of the new

content of a textbook program, by contrast, is a simpler matter. But even in the mathematics series this requires a great deal of study and a committment on the part of the teachers to learn new material. The presentation of new content requires less creative adaptation in the adoption cycle, but it nevertheless requires their cognitive committment. Using McGregor's model of 4 types or participation, the lowest level of participative management (McGregor, p. 126) was used by the ministry to explain the change to teachers and supervisors. Resentment and confusion ensued, so the teachers and supervisors objected that the new textbook program called for technological conditions which were impossible. (The suggested audio visuals were simply suggestions, not necessary conditions for use of the texts). The teacher retraining program is a higher level of participation. It will yield greater results in adoption and creative adaptation of the materials provided the retraining sessions involve teachers in exploring alternative adoption strategies. The expected changes in classroom behaviors by teachers and pupils required a revolution in the types of classroom interaction. From simple presenting and testing, the teacher had to learn to involve pupils in more complex communication patterns (pupil-pupil, as well as pupil-teacher, teacher-pupil) patterns. This calls for role restructuring in the classroom as well as mastering new content. Role restructuring requires a higher level of participation in order to learn the nuances of the new roles than simply following directions.

The next higher (third) level of participation would have required management to call in teachers for consultation before the texts were written (McGregor, p. 127). Valuable advice would have come from teachers which then could have made the textbook program or some curriculum materials program more adapted to field conditions. Pre-testing of the material in

the field with teacher suggestions modifying the material before putting it in the texts, would have yielded even greater dividends in the adoption cycle.

This third level of participation is still feasible with the fifth and sixth grade textbooks which have not yet been completely finished. The theoretical propositions of McGregor could be tested in the later phases of the textbook program and their adoption cycles could be compared with the adoption cycles of the first and second grade books.

McGregor's work implies that unless participative adoption is employed, creative adaptation will not follow, or at least the chances of creative adaptation will be lessened.

The problems of the adoptive cycles must not be confused with the value of the object--in this case the textbook. A new textbook in unquestionably a great resource. The adoptive cycle requires attention to the application of the thing adopted and its method of adoption. McGregor's theory relates to the participative phase of adoption. In no way does a problem of adoption vitiate the intrinsic worth of an object. A computer system is of tremendous value, but putting it to work in a new setting brings into view all kinds of adoption problems which are human, not technological in nature.

Another type of theoretical consideration is the social system context of the adoption cycle. Simple adoption of a complex textbook program with both content and methodological changes is impossible without the cooperation and imagination of the teacher coming into play. This was referred to as creative adaptation of the texts. In the adoptive cycle, the teachers would have to adopt the texts to their pupils' abilities and the availability of local resources. The teacher guides were addressed to this. Previously

teachers had used or not used a program, depending on the supervisor's demands or the perception of availability and cost.

The teacher's role in a situation where there are no programmed resources and few if any materials, can be seen as a non-technical or gemeinschaft role. In Parson's terms the teacher is acting a universalistic--ascriptive role (Parsons, p. 191). The role is universalistic which is almost like saying it is bureaucratic; it treats all clients alike, regardless of where the teacher is or who the pupils are. The role is ascriptive because the community grants status to the role without necessarily expecting production.

Introducing the textbook program nationwide with the concomitant expectations of changes in achievement and teacher classroom behavior introduces the expectation of a teacher playing a technical role. The teacher's role is now cast in an instrumental or production role. With the appropriate means, the teacher can obtain higher pupil achievement, and perhaps higher pupil involvement. The teacher as instrumentalist now plays a universalistic-achievement role (Parsons, 182). The teacher plays the same role no matter what the setting or the clients, but achieves something in the way of more learning and different kinds of learning. The teacher-pupil interactions now expected to be more diverse and less authority-oriented or less those of presentation-memory, must be demonstrably productive instead of simply essential or static. Being a teacher isn't enough--the teacher as instrumentalist is the role newly expected in the ministry. This is a revolution in role expectation. Abandoning a static position and moving toward a more evaluative mode is a more risky one if there is a change in public expectations to more demonstrable productivity.

The teacher's newly established technical role is then a break with the past in many ways. It is break with ascription (lack of achievement emphasis),

non-evaluation in terms of what learning has occurred, with a static conception of role (the teacher as presenter and questioner), and with the non-technical gemeinschaft quality of the teacher role. The culture of the classroom and school would now become more scientific, production-oriented, capable of evaluation in terms of achievement, more complex in kinds of teaching-learning relationships, and more charged with pupil participation. A very large order.

"Schools are conceived as less encyclopedic and bookish. They tend to provide more living experiences and more opportunities to exercise and develop the affective and intellectual capabilities . . . Teachers are supposed to function more as guides and counselors in the process of learning, acting as a team of experts to provide orientation and assistance. There is an increasing use of technical resources and an attempt to integrate the use of all the community's resources in the process of learning."

Angel Quintero-Alfaro sums up in this paragraph the perceived and expected changes in modern schools. His words describe the expected impact of the textbook program in Ecuador. These changes must be expected to occur unevenly across regions, cities and schools. The tempo of change in one society cannot be matched by another, because tempo is a cultural value. Each culture must be expected to create its own adoptive process. In order to complete an adoptive process according to a model, it may be necessary to revolutionize not only the school system but the society as well.

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