EVALUATING PUPIL PROGRESS FOR AN IN-SCHOOL TELEVISION PROJECT

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Seven Florida county school systems (Polk, Pinellas, Hillsborough, Pasco, Hernando, Sarasota and Manatee) work with WEDU, Channel 3, Tampa-St. Petersburg, to provide in-school use of educational television.

In the summer of 1959 these school systems and WEDU, in cooperation with the Ford Foundation, prepared for the use of television in large classes and for "Stoddard Plan" organization of certain elementary schools. Administrators, teachers, and patrons of each county school system asked how this work would affect the subject learnings of children in their county. An objective testing program was thereby needed which would involve as many counties and schools as was possible.

The study, entitled The Florida West Coast Project for Utilization of Television in large-class Teaching, was given the local name of Project 7.[1] As a part of the Ford Foundation's "National Program for the Use of Television in Public Schools", the objectives of Project 7 were:

a. To establish whether television could contribute significantly to the improvement of instruction in our area.

b. To establish whether the use of television, especially as a resource in teaching large classes, could contribute significantly to the improvement of education.

c. To demonstrate various means of class organization, with television as a resource, to effect suggestions for plant and staff utilization.

A Project Evaluating Committee, with a representative for each of the seven counties, was established by the Project Supervisory Committee to develop the testing design. This evaluation committee enumerated the following considerations for the testing program, which then became operational policies:

a. Limited funds required that the test design should make maximum use of the regular testing program in each county.

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[1]The details of the first year of the Project are to be found in: Project 7, First Year Report Florida West Coast Educational Television, Incorporated. Tampa, Florida, August, 1960 (41 pp).

b. The Educational Services Division of the Pinellas County School System would contract to do check scoring, machine scoring, and frequency distributions for test data.

c. The evaluation committee would decide which schools with TV-large classes would serve as demonstration schools for testing.

d. The evaluation committee member from each county would establish control schools to provide control cases, on the basis of socio-economic equality, and comparable numbers of cases to match with demonstration school cases.

e. The evaluation committee member from each county would be responsible for distribution of tests, and supervision of the testing program, in demonstration and control schools within his county.

f. Dates were established for testing in mid-September and late May.

g. Teachers of control groups were to have the curriculum guides used in the TV-large classes.

Extensive attitude questioning was an integral part of the evaluation. Teachers, parents, pupils and school administrators were asked to give anonymous responses to prepared questionnaires. This article does not deal with this aspect of the evaluation; however, reactions from all groups can generally be summarized as quite favorable.

School Organization

Some participating elementary schools were organized according to the "Stoddard Plan". Fifth and sixth grade students in each school participated in a reorganized school day. For one-half day, the student was assigned to a skills class under the direction of one teacher. The class size was set at between 22 to 27 pupils, and in these sections emphasis was given to reading, language arts and arithmetic. No television was used in these classrooms.

The remainder of the school day was organized for large-group activity. Each student spent 90 minutes in a large-class (150 pupils) working under the direction of one teacher, and viewing two telecasts, "Social Studies" and "Related Subjects". The TV position of the time totaled 45 minutes, with time between the two telecasts for classroom activities. After this 90-minute time block, the students were divided into groups of 40 to 75 for 45-minute periods of instruction in physical education, art, music, science, or for library and projects activities.

One elementary school used a modified "Stoddard Plan". In this case, because of severe overcrowding, only one-half the usual time could be devoted to work in the skills classrooms. The results of this organization are presented separately under Sub-study B.

Two participating elementary schools used only the elementary television lessons and large-class teaching for 90 minutes daily. In these cases, the students came into the large room from their self-contained classroom and returned to the regular classroom at the end of the 90-minute period. In both cases, three sections of sixth-grade students participated under the direction of one teacher with a second teacher assisting.

The general pattern of utilization of television in large classes was similar in all junior and senior high schools. The classroom period averaged 55 minutes in length, with 30 minutes of that time devoted to the tele-lesson and the remainder to classroom instruction. Each student had only one large television classroom in his school day. Classes ranged in size from 100 to 320 pupils.

The classes in secondary schools were conducted in a variety of rooms not ordinarily used for instruction. These included cafetoriums, all-purpose rooms, auditoriums and bandrooms. A large-class teacher was in charge of each classroom.

Most secondary classroom teachers had the majority of their teaching time after the telecast. However, some had this time before the tele-lesson, and in some cases the 25 minutes were split evenly before and after the tele-lesson. None of the large-class teachers had class assignments for more than three hours per day, which fact allowed him time for preparation, pupil conferences and evaluation.

The following subjects utilizing a daily television lesson were used in secondary schools:

7th grade mathematics	10th grade biology
8th grade U.S. history	12th grade American problems

Testing Procedure

Since there was no commercial test which adequately covered the elementary social studies curriculum, world history and world geography, a teacher-made test was designed. Items for this test were submitted by the two TV teachers, each large-class teacher, and by four to eight teachers from each county who were not using television in their sixth grade

classroom. Over forty teachers took part in item-writing for this test. The evaluation committee did the editing and the final selecting of items. This test was administered only to the sixth-grade students since control schools did not have a comparable curriculum in the fifth-grade. Well known standardized tests were used for social studies pretests and to measure growth in the skills subjects.

Existing commercial tests were used for secondary school evaluation. The selection of tests was made by the evaluation committee on the basis of the curriculum found in both demonstration and control classrooms, and on the basis of tests available within a limited budget. Maximum use was made of existing county test inventories. All test selections proved satisfactory except for the posttest used for United States History, eighth grade. That test did not represent the curriculum of the seven-county area. Therefore, no test results on this eighth grade U.S. History course can be reported.

The test coordinator for each of the seven counties set up a testing schedule for those schools participating either as experimental or control schools. The total testing time spanned less than a week for pretesting, and for posttesting, even though it was necessary to use the same test booklets in more than one school. Prior to the testing, coordinators met with participating teachers to establish uniform testing procedures. Test scoring was done by the Pinellas County Educational Services Division. The division transferred all information to IBM cards, and ran frequency distributions for use in the analysis of the data.

Table 1

Number of Students Tested

Grade	In Demonstration Schools	In Control Schools
5	935	682
6	1142	963
7	730	716
8	794	763
10	670	844
12	842	1068
	5113	5036

Analysis of Data

A method of analysis was devised which would to some extent meet the problems of having differing pre- and posttests and nonmatched groups on pretest performance: and at the same time would not require involved statistical manipulation of the data. This method requires that pupils must have taken both the pre- and posttests. It is based upon the assumption that if there was no difference in the effectiveness of two methods of instruction, then the two groups would not differ significantly between the pre- and posttests with respect to the frequency with which their respective members distributed themselves above and below the median performance of the combined groups. Thus, the method takes into account pretest differences between groups when posttest differences between groups are tested for significance.

The median pretest performance, in terms of raw scores, of each combined pair of groups was computed and the frequencies with which the members of the control group and of the demonstration group, respectively, fell above and below this combined median were recorded. Comparable statistics were determined for the posttest data. A Chi square design was used to analyze the data. The expected cell frequencies were the statistics drawn from the pretest data which are described above. The obtained cell frequencies were the comparable statistics based on the posttest data.[1]

Thus, the Chi square test was used to test the divergence of observed results from those expected on the hypothesis of equal probability (null hypothesis). The larger the Chi square, the greater the probability of a nonchance between the demonstration and control groups. When judging the significance of a Chi square, the .05 level of significance was used.

Results

Table 2 shows the testing program and rest results for the three regular "Stoddard Plan" schools. In that part of the school program for which social studies televised lessons were used with the large class, two of three studies shows a significant difference favoring large-class TV. In the third study where TV was also used with the regular control classes there was no statistically significant difference.

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[1]The method of analysis is described in Kropp, R. P. and W. L. Bashaw, A Chi Square Experimental Design That Controls Initial Performance. Tallahassee, Florida: School of Education, Florida State University. pp. 3. (mimeographed).

Table
Results, Stoddard Plan
Three Experimental

	Pretest	Posttest
Social Studies		
1. Sub-study A	California Test in Social Studies, Test 1, Part 1	Project-made Social Studies Test
2. Sub-study C	Metropolitan Achievement Intermediate Social Studies	Project-made Social Studies Test
3. Sub-study D	California Test in Social Studies, Test 1, Part 1	Project-made Social Studies Test
Reading		
4. Sub-study A	California Achievement/Elementary Reading Total/FormAA	California Achievement/ Elementary Reading/ Form CC
5. Sub-study C	Metropolitan Achievement/ Intermediate Reading	Stanford Achievement/ Intermediate Paragraph Meaning
6. Sub-study D	California Achievement/Elementary Reading Comprehension	Stanford Achievement/ Intermediate Paragraph Meaning
Language		
7. Sub-study A	California Achievement/elementary Language/FormAA	California Achievement/ Elementary Language/ Form CC
8. Sub-study C	Metropolitan Achievement/ Intermediate Language	Stanford Achievement/ Intermediate Language
9. Sub-study D	California Achievement/Elementary Mechanics of English	Stanford Achievement/ Elementary Arithmetic/ Form CC
Arithmetic		
10. Sub-study A	California Achievement/Elementary Arithmetic/FormAA	California Achievement/ Elementary Arithmetic/ Form CC
11. Sub-study C-1	Metropolitan Achievement Intermediate Arithmetic Problems	Stanford Achievement/ Intermediate Arithmetic Reason
12. Sub-study C-2	Metropolitan Achievement Intermediate Arithmetic Computation	Stanford Achievement/ Intermediate Arithmetic Computation
13. Sub-study D-1	California Achievement/Elementary Arithmetic Reason	Stanford Achievement/ Intermediate Arithmetic Reason
14. Sub-study D-2	California Achievement/ Elementary Arithmetic Fundamentals	Stanford Achievement/ Intermediate Arithmetic Computation

[1]Used TV Social Studies in Control Classes as well.
*Significant at .05 level.

2
Elementary, Grades 5 and 6
Schools Participating

Grade 5					Grade 6				
Number of Cases			Chi sq. favoring		Number of Cases			Chi sq. favoring	
X	C	Total	X	C	X	C	Total	X	C
					130	126[1]	256		2.53
					132	77	209	7.34*	
					157	92	249	3.97*	
123	96	219	.89		125	131	256	1.29	
118	85	203	.76		132	77	209		5.61*
129	73	202	10.36*		157	92	249	.14	
125	94	219	3.93*		127	130	257	7.58*	
116	83	199	.57		130	77	207		5.02*
129	73	202	4.40*		156	91	247	2.41	
125	98	223	25.70*		127	132	259	14.48*	
117	84	201		.59	130	77	207	4.58*	
116	83	193		.55	129	75	204	9.65*	
129	72	201	.76		156	91	247		3.64
129	72	201	13.12		156	91	247	8.10*	

Table 3
Results, Stoddard Plan Elementary, Modified Plan
One Experimental School Participating

	Pretest	Posttest	Grade 5 Number of cases X	C	Total	Chi sq. favoring X	C	Grade 6 Number of cases X	C	Total	Chi sq. favoring X	C
Social Studies	Stanford Achievement/Intermediate Social Studies	Project-made Social Studies Test						74	107	181	20.25*	
Reading	Stanford Achievement/Intermediate Paragraph Meaning/Form L	Stanford Achievement/Intermediate Paragraph Meaning/Form JM	85	118	203		.57	72	107	179	.04	
Language	Stanford Achievement/Intermediate Language/Form L	Stanford Achievement/Intermediate Language/Form JM	85	117	202		4.47*	72	106	178		5.14*
Arithmetic	1-Stanford Achievement/Intermediate Arithmetic Reasoning/Form L	Stanford Achievement/Intermediate Arithmetic Reasoning/Form JM	88	118	206		1.66	72	107	179		3.53
	2-Stanford Achievement/Intermediate Arithmentic Computation/Form L	Stanford Achievement/Intermediate Arithmetic Computation/Form JM	86	118	204		8.26*	72	107	179		5.92*

*Significant at .05 level.

For fifth-grade students in experimental skills classes, five out of eleven sub-studies showed significant differences favoring the "Stoddard Plan" organization for learning. None favored the traditional day. For sixth-grade students, five of eleven sub-studies significantly favored the "Stoddard Plan"; two of the eleven significantly favored the traditional school day.

Table 3 shows the results of testing when one school following a modified "Stoddard Plan" was compared with traditional control groups. In this experimental school only half of the time was spent on skills subjects as was the practice in the regular "Stoddard Plan" school.

In this experiment, TV-large class social studies was again significantly favored. For skills subjects, however, four out of eight sub-studies significantly favored the traditional school day, and none favored the modified reorganization.

One aspect of the research dealt with elementary school single-subject (social studies) TV in a large classroom. Experimental groups were established in two schools. Table 4 shows that in both sub-studies the students exposed to the experimental treatment gained in social studies learnings. Combining this information with that in Table 2 regarding large class-TV social studies, it seems that this method proved to be quite successful. Four of the six sub-studies significantly favored experimental groups. The two other sub-studies showed no significant difference.

Table 4

Elementary Single Subject-Large Class
Using Social Studies TV

	Pretest	Posttest	Number of Cases X	C	Total	Chi-square favoring X	C
Sub-study A	California Test in Social Studies, Test 1, Part 1	Project-made Social Studies Test	103	106	209	29.2	
Sub-study B	Stanford Achievement intermediate Social Studies	Project-made Social Studies Test	91	54	145	5.5	

Table 5
Junior and Senior High School Utilization of Television
With Large Class Instruction

I. 7th Grade Mathematics							
Sub-study A	California Arithmetic	Stanford Arithmetic					
	Fundamentals	Computation	383	550	933	.66	
	Reasoning	Reasoning	381	553	934		10.64*
Sub-study B	Metropolitan	Stanford Arithmetic					
	Computation	Computation	220	353	573		.17
	Problem Solving	Reasoning	215	348	563	6.17*	
II. High School Biology							
Sub-study A	School Ability Test, Total	Nelson Biology	94	156	250	.51	
Sub-study B	School Ability Test, Total	Nelson Biology	233	155	388		27.56*
Sub-study C	Mathematics and Science Prognostic	Nelson Biology	91	240	331	.42	
Sub-study D	DAT, Verbal	Nelson Biology	131	107	238		5.02*
III. High School American Problems							
Sub-study A	Lorge-Thorndike Verbal	Watson-Glaser Critical Thinking	174	323	497	2.53	
	Lorge-Thorndike Verbal	Dimond-Pflieger Problems	174	323	497	9.00*	
	Peltier-Durost	Dimond-Pflieger Problems	174	323	497	.77	
Sub-study B	Peltier-Durost	Dimond-Pflieger Problems	160	169	329	30.81*	
Sub-study C	Lorge-Thorndike Verbal	Watson-Glaser Critical Thinking	106	104	210		2.45
	Lorge-Thorndike Verbal	Dimond-Pflieger Problems	106	104	210	.00	.00
	Peltier-Durost	Dimond-Pflieger Problems	106	104	210	2.08	
Sub-study D	Lorge-Thorndike Verbal	Watson-Glaser Critical Thinking	126	94	220	.81	
	Lorge-Thorndike Verbal	Dimond-Pflieger Problems	126	94	220	2.83	
	Peltier-Durost	Dimond-Pflieger Problems	126	94	220		13.92*
Sub-study E	Lorge-Thorndike Verbal	Watson-Glaser Critical Thinking	82	72	154	.89	
	Lorge-Thorndile Verbal	Dimond-Pflieger Problems	82	72	154	1.36	

*Significant at .05 level

Table 5 presents the results of testing for subject learning gains in the junior and senior high schools. Students studying a subject in a large class urilizing television for a portion of the daily lesson were matched against students being taught in conventionally sized classes without television.

The results in seventh grade mathematics reveal no significant gains for either method of instruction. The groups did not differ in arithmetic fundamentals. In arithmetic reasoning one sub-study favored the experimental group and one favored the control group.

Two of the four sub-studies dealing with biology subject-matter learnings revealed significant differences favoring control groups.

Five sub-studies were conducted on American Problems in the twelfth grade. In three of these, four tests were administered to permit three different analyses of the data; -- thus there were twelve comparisons. Two of the twelve comparisons significantly favored experimental groups and one favored a control group. The remaining nine comparisons, seven of the nine favored experimental groups, did not yield significant results.

Summary

With the advent of television as a daily teaching resource for the large classes and as a part of the organization of the "Stoddard Plan" school, an objective testing program was needed for a comparison of subject matter gains of students. Limitations of staff and finances made it necessary to find means of gathering data based upon existing testing programs in the seven participating counties. As a result, it was frequently necessary to have differing pre and posttests. Furthermore, although every attempt was made to match students on the basis of similarity of schools and cultural and socio-economic backgrounds, pretest information often indicated that groups were not matched on pretest performances. It was necessary, therefore, to develop a mathod of analysis which would deal with these problems.

When reviewing the objectives of Project 7 which were established at the beginning of the study, the preliminary evaluation reported here indicates the following:

a. Television can contribute significantly to the improvement of instruction,

b. Television used as a resource in teaching large classes can contribute significantly to the improvement of education, and

c. A variety of means of class organizations can be developed which will provide greater utilization of school plant and school staff.

Acting on the recommendations of the school superintendents of the seven county school systems that participated, the Project Evaluation Committee is continuing the research through the school year 1960-61. It is expected that more refined research techniques will be used in later studies. A goal of the second-year study is to provide information about the effect of television and large classes on various sub-groupings of the student population that will be studied.