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ABSTRACT

The extent to which the use of the Graphics Expression Reading Improvement System (GERIS) improved the reading skills of Title I was investigated. The GERIS program, which combines an eight-step process in language skill development with student-created television productions, was used at two schools during the 1972-73 school year. One hundred seventy-two students in grades 4 through 6 and 7 through 9, each of whom was reading at least two years below grade level, were included in the program. Post-test results from the Stanford Achievement Test indicated that students in grades 4 through 6 showed significant improvement in reading for the first time in their school careers; their achievement in both word meaning and paragraph meaning was double that which otherwise would have been expected. An improvement in achievement significant at the .05 level was not found for students in grades 7 through 9, although the seventh graders did show over a year's growth and did achieve at a rate well over twice that of their previous performance in traditional reading programs. It was concluded that GERIS can effect dramatic improvements in reading among problem readers at the lower grade levels. (Author/PB)

GRAPHICS EXPRESSION READING IMPROVEMENT SYSTEM

Evaluation Report
1972-73

This analysis was prepared by the New York State Education Department, Division of Research and Educational Communications, in cooperation with Uniondale Free School District #2.

SUMMARY

The following analysis reports the results of a Title I program in Uniondale Free School District #2 for 1972-73. It involves a total of 172 students who were reading at least two years below grade level. One hundred thirty-one (131) of these students were in grades 4-6 and forty-one (41) were in grades 7-9.

An analysis of the data indicates that the Graphics Expression Reading Improvement System (GERIS) produced highly significant improvement at the grade 4-6 level. The majority of students achieved at nearly twice the rate they had under previous traditional programs in word meaning, as measured by the Stanford Achievement Test. In paragraph meaning, these students again achieved at about twice the rate they previously had. Also worthy of note is that this is the first time that this group has ever had a gain of approximately a full year/year during their reading history in school.

At grade 7-9 the analysis does not indicate a significant change in achievement at the .05 level. However, the grade 7 component did achieve highly significant growth, that is, well over a year's growth and at a rate well over twice that during previous years in traditional programs.

This evaluation suggests that the Graphics Expression Reading Improvement System (GERIS) appears to have its greatest potential for effecting the most dramatic results at the earlier grade levels.

GRAPHICS EXPRESSION READING IMPROVEMENT SYSTEM

DATA ANALYSIS

GRADES 4-5-6

Student Selection

Students were given an Informal Reading Inventory by the school Reading Specialist. Those students who were determined to be two or more years below grade level were included in this program.

Program Description

The Graphics Expression Reading Improvement System (GERIS), a motivational approach to the teaching of reading, is designed for use in a regular classroom setting where an 8-step process in language skills is combined with television production. A unique 3-camera mini-studio allows the child to produce his own show with many of the same "special effects" he sees on his home screen. For a more thorough, detailed description of the treatment, see the Manual for Administrators (attached).

For the purpose of this program, the treatment was eight months in duration, commencing in late September 1972 and ending in May 1973.

Experimental Hypothesis

Those students in the GERIS program will achieve greater actual gains than their historic rates of gain would predict. This greater achievement will affect scores on both word meaning and paragraph meaning, as measured by the Stanford Achievement Test.

Analysis

The measures used were the "expected gain" and the "actual gain" of each student in both word and paragraph meanings. The "expected gain" was determined by applying to the pre-test scores the method and formula recommended in the Title I guidelines for evaluation. (See Appendix A). The "actual gain" was determined by computing the difference between the pre- and post-test scores on the Stanford Achievement Test. The gains were compared by applying the t-test to determine whether the students involved achieved beyond expectation.

Data

Composite scores: grades 4 to 6 in three schools

Word meaning	N = 131
Mean Expected Gain	.46
Mean Actual Gain	.96
Paragraph meaning	N = 129
Mean Expected Gain	.45
Mean Actual Gain	.87

With a t-score of 5.9 and 130 df in word meaning the results are highly significant at less than the .0005 level. We may infer that this target population achieved far beyond (109% beyond) expectation. It appears that these students are achieving at about twice the rate they did under previous traditional programs in the area of word meaning. The data analysis for paragraph meaning duplicates almost the same achievement. It is significant to note that this is the first time the group has ever had a gain of approximately a full year/year during their history at school under traditional instruction.

Student Selection

At the end of grade 6, the student population was administered the Gates-McGinitie Reading Test. Those students falling below grade level were placed in the general remedial reading program for grade 7 at Turtle Hook Junior High School. From this group, those students in need of greatest help (below reading level by approximately 2.5 years on the average) were placed in the Graphics Expression component. Grades 8 and 9 students in the general remedial reading program were also administered the Gates-McGinitie Reading Test by the Reading Teacher. All those who remained below grade level were continued in the program described above.

Program Description

In general, the program operates approximately as does the one described in the Manual (attached). The two variations of note are: 1) grades 7 to 9 meet 45 minutes a day, 5 days a week, as compared with grades 4-6 who meet 3 days a week; and 2) the Reading Teacher works with the students in the Reading Room while the Graphics Aide works with the students in a separate room. At the grade 4-6 level the entire program is contained within one regular classroom area.

Experimental Hypothesis

Those students in the GERIS program will achieve greater actual gains than their historic rates of gain predict, as measured by the Gates-McGinitie Reading Test.

Analysis

The measures used were the "expected gain" and the "actual gain" of each student as determined by scores on a standardized test. The "expected gain" was computed by applying to the pre-test scores the method and formula recommended in the Title I guidelines for evaluation (See Appendix A). The "actual gain" was determined by computing the difference between the pre- and post-test scores on the Gates-McGinitie Reading Test. The gains were compared by applying the t-test to determine whether the students achieved beyond expectation.

Data

Composite scores: Grades 7-8-9 in one school
N = 41

Grade 7	Mean Expected Gain	.52
	Mean Actual Gain	1.37*
Grade 8	Mean Expected Gain	.69
	Mean Actual Gain	.88*
Grade 9	Mean Expected Gain	.64
	Mean Actual Gain	.61*
Composite 7-8-9	Mean Expected Gain	.62
	Mean Actual Gain	.89

With a t-score of 1.54 and 40 df, the composite results are not significant at the .05 level. However, if the three components are considered separately, it will be noted that grade 7 achieved a noteworthy gain which was significant at the .001 level. Grade 8 achieved somewhat more than what was expected. Grade 9 achieved only as expected. It may be inferred from this data that GERIS is more effective at the earlier grade level. This inference is supported by the highly significant growth in grades 4-5-6.

Conclusion

From this analysis, it may be concluded that the innovative and motivational approach to reading which GERIS embodies has its greater potential for effecting dramatic reading improvement at the earlier grade levels.

Appendix A

ACTUAL POST TEST COMPARISON TO THE PREDICTED POST TEST SCHEME OF DATA ANALYSIS

Real (treatment) Posttest v. anticipated (without treatment) Posttest design.

Step 1. Obtain each pupil's pretest grade equivalent.

Step 2. Subtract 1 (since most standardized tests start at 1.0).

Step 3. Divide the figure obtained in step 2 by the number of months the pupil has been in school to obtain a hypothetical (historical regression) rate of growth per month. (Ignore Kindergarten months. 1 school year = 10 months.)

Step 4. Multiply the number of months of Title I treatment by the historical rate of growth per month.

Step 5. Add the figure obtained in step 4 to the pupil's pretest grade equivalent (step 1).

Step 6. Test the difference for significance between the group predicted posttest mean and the obtained posttest mean with a correlated t-ratio.

In September, a diagnostic reading teacher administered the Metropolitan Achievement Test (as a pretest) to thirty disadvantaged fourth grade learners who had scored below minimum competence on the New York State Reading PEP Test.

The thirty pupils participated for the first time in an ESEA Title I remedial project conducted from the first week in October through the last week in May (treatment time = 8 months). The Reading Diagnostician readministered an equivalent level form of the Metropolitan Achievement Test (as a posttest) during the first week of June to the thirty pupils.

From the September (pretest) administration, the Diagnostician calculated the individual predicted June scores based upon the pupils historical rate of gain (using the method described in steps 1 through 4 above) that would have been anticipated if the ESEA Title I treatment had not intervened in addition to the regular classroom reading instruction. The Diagnostician then compared the predicted posttest scores to the actual posttest scores by the statistic called the t-ratio (critical ratio) to determine whether the thirty pupils achievement was beyond expectation.

The pupils have had 30 months of regular school at the time of the pretest.

Step 1. Pupil #1's pretest score was 2.5

Step 2. Subtract 1 from 2.5 = 1.5

Step 3. Divide 1.5 by 30 (months) = .05
multiply .05 times the number of months of Title 1 treatment .05x8 = .4

Step 4. Add .4 to (the pretest) 2.5 = 2.9
this figure is the anticipated posttest score (2.9) for pupil #1

Repeat for each pupil

Record each pupil's May Posttest score

Subtract each predicted posttest score from the actual (May) posttest score [d]

Sum the differences [Σd] and square that sum [$(\Sigma d)^2$]

Square the differences individually

Sum the squared differences $\Sigma(d^2)$

$$t = \frac{\Sigma d}{\sqrt{\left[N \ \Sigma(d^2) - (\Sigma d)^2\right]/(N-1)}}$$

$$t = \frac{9.2}{\sqrt{\left[30\ (4.62) - (9.2)^2\right]/(30-1)}} = \frac{9.2}{\sqrt{\frac{53.96}{29}}} = \frac{9.2}{\sqrt{1.86}} = \frac{9.2}{1.36} = 6.76$$

The degrees of freedom (df)=N-1. Look in the t table opposite df=29 for the value of t under columns .05 and .01 (two tailed tests). Since our t of 6.76 is greater than the table value of 2.756, at the .01 level of probability, we may infer that this target population achieved beyond expectation in the Title I funded treatment.

Pupil	Pretest	Posttest Predicted	Posttest Actual	d difference	d^2 difference Squared
1	2.5	2.9	3.2	+ .3	.09
2	2.8	3.3	3.5	+ .2	.04
3	2.2	2.5	2.6	+ .1	.01
4	1.8	2.0	2.0	0	.00
5	2.9	3.4	3.8	+ .4	.16
6	3.0	3.5	3.9	+ .4	.16
7	2.8	3.3	3.2	- .1	.01
8	2.5	2.9	3.2	+ .3	.09
9	2.3	2.7	2.8	+ .1	.01
10	2.0	2.3	2.8	+ .5	.25
11	2.1	2.4	3.0	+ .6	.36
12	2.7	3.1	3.2	+ .1	.01
13	2.0	2.3	2.5	+ .2	.04
14	2.5	2.9	3.5	+ .6	.36
15	2.4	2.8	2.7	- .1	.01
16	2.2	2.5	2.7	+ .2	.04
17	2.6	3.0	3.2	+ .2	.04
18	2.3	2.7	2.9	+ .2	.04
19	2.2	2.5	3.0	+ .5	.25
20	2.5	2.9	3.7	+ .8	.64
21	2.3	2.7	2.9	+ .2	.04
22	2.8	3.3	3.9	+ .6	.36
23	1.5	1.6	1.8	+ .2	.04
24	2.7	3.1	3.4	+ .3	.09
25	2.3	2.7	3.1	+ .4	.16
26	2.5	2.9	3.2	+ .3	.09
27	2.1	2.4	2.8	+ .4	.16
28	2.2	2.5	3.0	+ .5	.25
29	2.3	2.7	3.6	+ .9	.81
30	2.7	3.1	3.0	- .1	.01
N = 30 SUM (or Σ)	71.7	82.9	92.1	+9.2	4.62
MEAN	2.39	2.76	3.07		

THIS TABLE CAN BE FOUND IN

Ferguson, George A., Statistical Analysis in Psychology and Education. 2nd ed. New York: McGraw-Hill Book Company, 1966, p. 406.

Critical values of t^*

df	Level of significance for one-tailed test					
	.10	.05	.025	.01	.005	.0005
	Level of significance for two-tailed test					
	.20	.10	.05	.02	.01	.001
1	3.078	6.314	12.706	31.821	63.657	636.619
2	1.886	2.920	4.303	6.965	9.925	31.598
3	1.638	2.353	3.182	4.541	5.841	12.941
4	1.533	2.132	2.776	3.747	4.604	8.610
5	1.476	2.015	2.571	3.365	4.032	6.859
6	1.440	1.943	2.447	3.143	3.707	5.959
7	1.415	1.895	2.365	2.998	3.499	5.405
8	1.397	1.860	2.306	2.896	3.355	5.041
9	1.383	1.833	2.262	2.821	3.250	4.781
10	1.372	1.812	2.228	2.764	3.169	4.587
11	1.363	1.796	2.201	2.718	3.106	4.437
12	1.356	1.782	2.179	2.681	3.055	4.318
13	1.350	1.771	2.160	2.650	3.012	4.221
14	1.345	1.761	2.145	2.624	2.977	4.140
15	1.341	1.753	2.131	2.602	2.947	4.073
16	1.337	1.746	2.120	2.583	2.921	4.015
17	1.333	1.740	2.110	2.567	2.898	3.965
18	1.330	1.734	2.101	2.552	2.878	3.922
19	1.328	1.729	2.093	2.539	2.861	3.883
20	1.325	1.725	2.086	2.528	2.845	3.850
21	1.323	1.721	2.080	2.518	2.831	3.819
22	1.321	1.717	2.074	2.508	2.819	3.792
23	1.319	1.714	2.069	2.500	2.807	3.767
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690
28	1.313	1.701	2.048	2.467	2.763	3.674
29	1.311	1.699	2.045	2.462	2.756	3.659
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.291

* Abridged from Table III of R. A. Fisher and F. Yates, *Statistical tables for biological, agricultural, and medical research*, published by Oliver & Boyd, Ltd., Edinburgh, by permission of the authors and publishers.

If assistance in interpreting this Table is desired, please contact:
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