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ABSTRACT

In an effort to determine if achievement gains of low-achieving Chapter 1 students could be bettered, the Austin Independent School District implemented Chapter 1 Schoolwide Projects (SWP) in two schools to reduce class size to 15 pupils per teacher. SWP teachers functioned as regular classroom teachers with students of mixed achievement. Chapter 1 students received supplementary reading instruction from Chapter 1 teachers. Because 90-95% percent of SWP students were Hispanic, analyses were restricted to include Hispanic students only. Analyses used were a regression approach to analysis of covariance, with the pretest score as covariate. A series of regression models was constructed with the posttest as the dependent variable. A systematic series of model comparisons resulted in discovery of the model which combined the best prediction of posttest scores with the fewest predictor vectors. The same comparisons have been made since 1980-81, the first year of the implementation of SWP in the district. Findings revealed few differences between SWP and regular Chapter 1, indicating that SWPs may be producing some reading achievement gains, but generally not significantly more than the less expensive Chapter 1 Program. Results are discussed in terms of achievement results, costs, findings from the literature, and political considerations. (RH)

Schoolwide Projects: The Almost Revolution (?) Six Years Later

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Objective

This paper focuses on our District's experience with reducing class size in two elementary schools and its effect on low-achieving students' achievement. The discussion will try to tie together achievement results, costs, the literature, and politics.

Introduction

When a school has 75% or more low-income students residing in its attendance area, it can be eligible to be a Chapter 1 Schoolwide Project (SWP). In a SWP Chapter 1 contributes its usual amount based on the number of low-achievers, while the District provides additional funds to reduce the overall pupil teacher-ratio within the school to 15 to 1. SWP teachers paid from Chapter 1 funds function as regular classroom teachers with students of mixed achievement levels and a lower pupil teacher ratio. All students are considered served by Chapter 1 in SWPs.

Our District funded the only two schools-Allison (grades K-3) and Becker (grades K-6) eligible under these criteria beginning in 1980-81 and has continued funding both through 1986-87. One school has not been eligible under Chapter 1 criteria since 1984-85. The District has continued this SWP, paying the whole cost. Since the achievement results were less than glowing, especially at the upper grade levels, one campus was made an SWP at grades K-3 only and given supplemental Chapter 1 teachers at the upper grade levels in 1984-85. Due to community pressure in 1985-86 the whole school (grades K-6) was funded again as a SWP.

Methods

The reason that our District opted to implement SWPs was to see if we could produce better achievement gains for low-achieving students in SWPs than in our regular Chapter 1 program (where students receive supplementary reading instruction from Chapter 1 teachers). Therefore the gains of low-achieving (pretest score at or below the 30th%ile on the Iowa Tests of Basic Skills (ITBS) Reading Total) SWP students were compared with the gains of similar students served in the regular Chapter 1 program. Because our District was under massive court-ordered crosstown bussing for desegregation at all the traditional Chapter 1/Title I schools, but not at the SWPs, only students who resided in a traditional Title I attendance area were included. Finally since between 90% and 95% of the SWP students were Hispanic, the students in the analyses were restricted to Hispanics.

In all the gains analyses, students who were missing either a pretest or a posttest score were omitted. In addition, students with special circumstances marked on either their pre- or posttest were omitted. Limited English Proficient and Special Education students with valid (not for experience only) pre- and posttest scores were included. The dependent variable is the Reading Total grade equivalent (GE) for each student (except at kindergarten, when the Language Total GE was used). The student's pretest score was used as the covariate. Separate analyses were done by grade.

The analyses used were a regression approach to analysis of covariance, with the pretest score as covariate. A series of regression models was constructed with the posttest as the dependent variable. See Attachment 1. The residual sum of squares associated with each model was obtained using the GLM (General Linear Models) procedure via SAS (Statistical Analysis System) on the District's IBM mainframe system. A systematic series of model comparisons was done, until the model was found which combined the best prediction of posttest scores (i.e., the lowest residual sum of squares) with the fewest predict vectors. All model comparisons were evaluated by an F-test. See Attachment 1, page 2 for the F formual and a flowchart of model comparisons.

These same comparisons have been made since 1980-81--the first year of the implementation of SWP in our District.

Results

In looking at the 1985 to 1986 results, there were few differences between SWP and regular Chapter 1. See Figure 1. At grades K-3 and 6, there were no statistically significant differences. At grade 4, SWP students had higher gains. At grade 5, the SWP students at the lowest achievement levels gained more, while for the relatively higher scoring low-achieving students there were no differences between the groups.

Grade	Pre/Post	Becker	Chapter 1	Statistically Significant
K	Pre	-.50 (n=38)	-.53 (n=179)	
	Post	.13 (n=38)	.22 (n=179)	no
1	Pre	-.14 (n=18)	-.16 (n=143)	
	Post	1.42 (n=18)	1.32 (n=143)	no
2	Pre	1.00 (n=4)	0.96 (n=80)	
	Post	1.88 (n=4)	1.82 (n=80)	no
3	Pre	1.86 (n=15)	1.73 (n=136)	
	Post	2.89 (n=15)	2.67 (n=136)	no
4	Pre	2.56 (n=17)	2.44 (n=112)	
	Post	3.72 (n=17)	3.27 (n=112)	yes (across all levels of the pretest)
5	Pre	3.51 (n=22)	3.38 (n=143)	
	Post	4.71 (n=22)	4.11 (n=143)	yes (only at the lower)
6	Pre	3.87 (n=18)	4.01 (n=138)	Levels of the pretest)
	Post	4.77 (n=18)	4.96 (n=138)	no

Figure 1. MEAN PRE- AND POSTTEST GE ITBS READING TOTAL (LANGUAGE FOR K), BY GRADE FOR SIMILAR LOW-ACHIEVING STUDENTS AT BECKER AND CHAPTER 1 SCHOOLS, 1985-86.

Figure 2 shows there were no statistically significant differences in the gains at grades K-3 between the two SWP schools.

Grade	Pre/Post	Becker	Allison	Statistically Significant
K	Pre	-.50 (n=38)	-.56 (n=46)	
	Post	.13 (n=38)	.07 (n=46)	no
1	Pre	-.14 (n=18)	-.17 (n=39)	
	Post	1.42 (n=18)	1.45 (n=39)	no
2	Pre	1.00 (n=4)	0.99 (n=12)	
	Post	1.88 (n=4)	1.90 (n=12)	no
3	Pre	1.86 (n=15)	1.82 (n=29)	
	Post	2.89 (n=15)	2.84 (n=29)	no

Figure 2. MEAN PRE- AND POSTTEST GE ITBS READING TOTAL (LANGUAGE FOR K), BY GRADE FOR SIMILAR LOW-ACHIEVING STUDENTS AT ALLISON AND BECKER, 1985-86.

Since Limited English Proficient (LEP) students are an important subgroup of these students similar regression analyses were performed on low-achieving LEP students. The students selected were not retained and resided in a traditional Title I attendance area. Figure 3 below presents these results by grade. There were no statistically reliable differences in gains. The number of students were small in each group so these results should be interpreted cautiously.

Grade	Pre/Post	SWP-LEP	Chapter 1-LEP	Statistically Significant
K	Pre	-.63 (n=12)	-.55 (n=48)	
	Post	-.14 (n=12)	-.10 (n=48)	no
1	Pre	-.28 (n=11)	-.30 (n=47)	
	Post	1.16 (n=11)	1.02 (n=47)	no
2	Pre	0.85 (n=6)	0.84 (n=28)	
	Post	1.92 (n=6)	1.51 (n=28)	no
3	Pre	1.58 (n=10)	1.58 (n=49)	
	Post	2.66 (n=10)	2.70 (n=49)	no
4	Pre	2.10 (n=4)	2.43 (n=43)	
	Post	3.05 (n=4)	3.20 (n=43)	no
5	Pre	3.10 (n=2)	3.16 (n=42)	
	Post	4.10 (n=2)	3.70 (n=42)	no
6	Pre	2.78 (n=4)	3.69 (n=60)	
	Post	3.95 (n=4)	4.57 (n=60)	no

Figure 3. MEAN PRE- AND POSTTEST GE ITBS READING TOTAL (LANGUAGE FOR K), BY GRADE FOR SIMILAR LOW-ACHIEVING STUDENTS AT SWP AND CHAPTER 1 SCHOOLS, 1985-86.

Going back to the picture of all low-achievers, how do the one-year achievement gains of SWP students during the last six years compare with gains made by Chapter 1 students? As can be seen illustrated in Figure 4, there were clearly superior achievement gains in the first year for SWP low-achievers. However, in years since the results have been mixed with only one or two grade levels showing clear gains across achievement levels.

Year	GRADE K	1	2	3	4	5	6
1980-81	No Scores Avail-able	+	+	+	+	+	+
1981-82	+	+	•	•	-	•	•
1982-83	•	*	+	**	•	**	**
1983-84	+	*	-	•	•	•	•
1984-85	•	***	+	•	(there were no grades 4, 5, 6 SWP students)		
1985-86	•	ɔ	•	•	+	***	•

Legend:

+ = Schoolwide Project (SWP) students did better

- = Chapter 1 Regular students did better

• = No difference between SWP and Chapter 1 Regular students

* = SWP students who had higher pretest scores did better; no difference otherwise

** = SWP students who had higher pretest scores did better; Chapter 1 Regular students with lower pretest scores did better

*** = SWP students with lower pretest scores did better; no difference otherwise

Figure 4. SUMMARY OF LOW-ACHIEVING SWP STUDENTS' ACHIEVEMENT GAINS VS. CHAPTER 1 STUDENTS' ACHIEVEMENT GAINS FOR 1980-81 THROUGH 1985-86.

More details of these analyses can be found in Doss, Washington, Moede, and Mulkey, 1981; Carsrud, Burleson, and Washington, 1982; Carsrud, Sailor, and Washington, 1983; Jordan-Davis, Sailor, and Rodgers, 1984, Jordan-Davis, Sailor. and Rodgers, 1985; and Christner, Rodgers, Leben, and Prevost, 1985.

Discussion

After the first year's glowing achievement results described in two AERA papers (Doss and Holley, 1982 and Carsrud and Doss, 1983) where is the "almost revolution" (as Carsrud and Doss labeled SWPs) now? Over the long term the achievement results for low-achievers produced look less than revolutionary.

At the end of the 1985-86 school year, the District had invested over $1.6 million dollars in teacher salaries and benefits over and above the regular school contribution to lower the pupil teacher ratio to 15 to 1. Chapter 1 had invested 1.2 million dollars--the amount it would have invested with or without Schoolwide Projects in these two schools. Was the extra 1.6 million dollars worth it? This really depends on which variable you look at and how you look at it.

Achievement is the variable we have focused on since SWPs were created to be a better achievement boost to low-achieving students than was the regular Title I/Chapter 1 Program. The data in Figure 4 represent our best comparison of Chapter 1 and SWP low-achieving students.

One of the problems we have with interpreting these data is the variation in the results each year. The first year all grades showed outstanding gains. The next year it was grades K, 1; the next it was part of grade 1 and grade 2 and parts of grades 3, 5, and 6, etc. These results are difficult to explain because there is no truly consistent pattern.

Why did our students start off with such a bang and continue less than glowingly? We have some hypotheses, but not absolute answers.

During the years our District has had SWPs, two other things have happened to make it harder for SWP to produce higher gains than Chapter 1 students and higher gains than other schools in the District as a whole. One of the primary School Board priorities over the last several years has been to increase minority student achievement. Due to the districtwide efforts occurring as a result of this emphasis the achievement scores of minority students over all have slowly, but surely been increasing--this is especially true of Hispanics. The second thing that has occured is a strengthening of the regular Chapter 1 Program. Over the same time period that SWPs have been in existence the Department of Elementary Education and the compensatory coordinators have really focused on improving the Chapter 1 Program--especially the coordination with the regular education program. This has paid off in a stronger program that has been producing better gains. SWPs therefore has harder competition than it might have otherwise.

Proponents of SWPs in our District have pointed to the decreased number of Chapter 1 eligible students at SWP campuses as one sign of their success. This has indeed been the case. The percent of Chapter 1 eligible students has gone from 66% in 1980-81 to 40% in 1986-87. However, although this certainly is a positive sign, there has been a decrease districtwide in the number of Chapter 1-eligible students.

Therefore one cannot (with certainty) attribute the decrease in eligible students solely to SWPs.

What about longer term achievement gains? In 1983-84 a followup was done of achievement levels of students who had been in SWPs for four years and students in regular Title I/Chapter 1 schools. All compared students were low-achievers initially. Former SWP kindergarteners had a two-month achievement advantage over similar Chapter 1 students. Former grades 1 and 2 students show no differences in gains. While higher-scoring SWP low-achievers at grade 3 had a three-month advantage, lower-scoring SWP low-achievers at grade 3 (in 1980-81) had the same gains as their Chapter 1 counterparts.

Does the school community like SWPs? You bet! When SWP was reduced to grades K-3 at Becker in 1984-85, the Becker parents and local community raised a fuss. So much so that it was community pressure that got SWPs reinstated across all grade levels in 1985-86. Ironically the Chapter 1-served, non-SWP students at Becker in 1984-85 made as good gains as their SWP counterparts.

Do principals and teachers like SWPs? Yes! The principals have remained staunch supporters of the SWP program over its years of implementation. In 1980-81 interviews with teachers indicated they loved SWPs. No teacher interviews have been done since and many of the teachers initially in the schools are no longer at the schools.

What does all this mean? It means that SWPs as they are currently operating may be producing some reading achievement gains and improvement, but generally not significantly more than the less expensive Chapter 1 Program. The community likes the program and does not want SWPs "taken away" from them. In interviewing Chapter 1 principals this year (Christner, Rodgers, Fairchild, and Gutierrez, 1987), the large majority felt lowering the pupil teacher ratio was the single best way to improve the achievement of low-achievers.

Glass, Cohen, Smith, and Filby (1982) are strong proponents of lowering the pupil-teacher ratio to get achievement gains. Robinson and Wittebols (1986) offer a more cautious summary of class size and achievement gains. With our District's experience with SWPs, we must take the cautious road as well. Lowering the pupil teacher ratio does not guarantee achievement gains. Robinson and Wittebols (1986) report that lowering the class size will probably not benefit students a whole lot if teachers use the same instructional methods, etc. that they use in larger classes. This is one factor I feel may well explain why our SWPs have not produced consistently large achievement gains. There has been no continuing staff development for SWP teachers (many of whom are new to SWPs) on how to take advantage of smaller class size and teach differently than would be done with a larger class.

Ironically this AERA paper almost never got written. Our School Board is strongly considering going back to neighborhood schools at grades K-5. Currently many elementary schools are paired and there is massive crosstown bussing. My staff and I have been involved in doing analyses

of how proposed changes in the boundaries affect the school populations. Also various literature reviews have been conducted on how best to improve minority and disadvantaged student achievement. This has been a very hectic process to get information the Board and the Administration could use to plan, etc. in a timely manner. The ironic part is what is being planned for the 16 schools which would have a high minority enrollment if the plan is passed. You probably guessed it--Schoolwide Projects!

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Variables

U = unit vector

1 = posttest

2 = pretest

3 = pretest if group 1; 0, otherwise

4 = pretest if group 2; 0, otherwise

5 = pretest if group 3; 0, otherwise

6 = pretest squared (variable 2 squared)

7 = variable 3 squared

8 = variable 4 squared

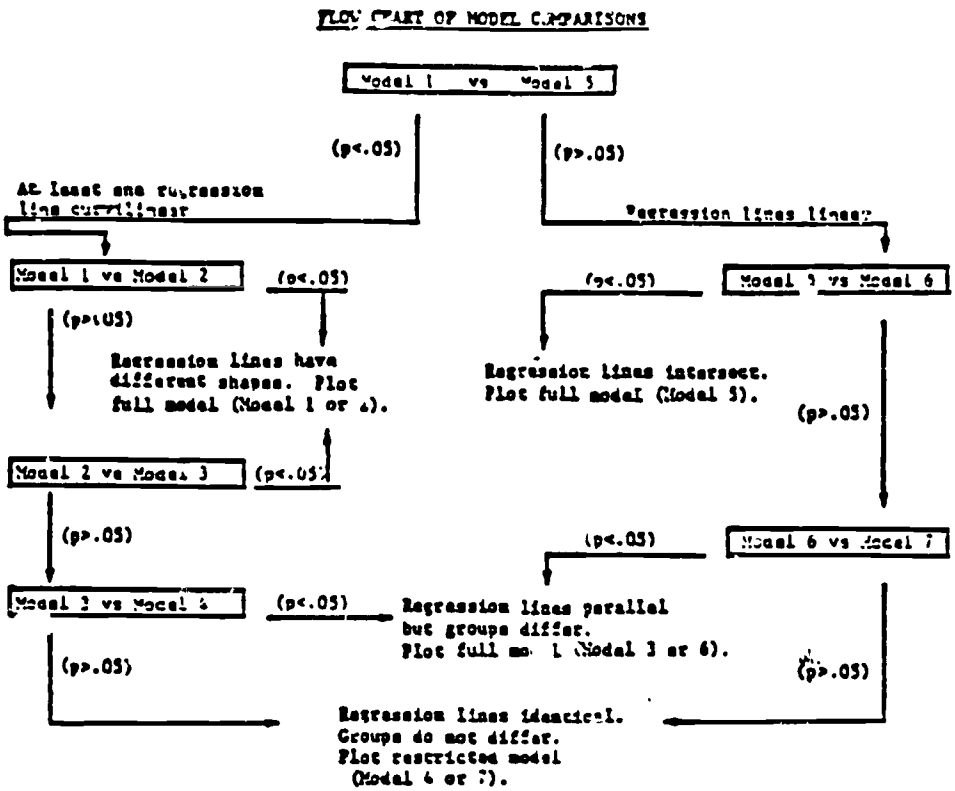
9 = variable 5 squared

10 = 1 of group 1; 0, otherwise

11 = 1 if group 2; 0, otherwise

12 = 1 if group 3; 0, otherwise

Models		Comments
Model 1	1 = U + 3 + 4 + 5 + 7 + 8 + 9 + 10 + 11 + 12	Allows independent curvilinear regression lines.
Model 2	1 = U + 3 + 4 + 5 + 6 + 10 + 11 + 12	Requires quadratic component of lines to be equal for each group. Intercepts may differ.
Model 3	1 = U + 2 + 6 + 10 + 11 + 12	Requires parallel curvilinear regression lines. Intercepts may differ.
Model 4	1 = U + 2 + 6	Requires parallel curvilinear regression lines with common intercept.
Model 5	1 = U + 3 + 4 + 5 + 10 + 11 + 12	Allows independent (different) linear (straight line) regression lines.
Model 6	1 = U + 2 + 10 + 11 + 12	Requires common linear slopes; and intercepts may differ.
Model 7	1 = U + 2	Requires common linear slopes and common intercepts.



Calculation of F for Model Comparisons

$$F = \frac{(ESS_r - ESS_f)/df_1}{ESS_f/df_2}$$

Where

ESS_r = residual sum of squares for the model with fewer predictors (restricted model).

ESS_f = residual sum of squares for the model with more predictors (full model).

df_1 = the number of independent predictor vectors in the full model minus the number in the restricted model.

df_2 = the number of cases minus the number of independent predictors in the full model.