

DOCUMENT RESUME

ED 407 699

EA 028 267

AUTHOR Illig, David C.
 TITLE Reducing Class Size: A Review of the Literature and Options for Consideration.
 INSTITUTION California State Library, Sacramento. California Research Bureau.
 PUB DATE 97
 NOTE 19p.
 AVAILABLE FROM California Research Bureau, California State Library, P.O. Box 942837, Sacramento, CA 94237-0001 (single copies free).
 PUB TYPE Information Analyses (070)
 EDRS PRICE MF01/PC01 Plus Postage.
 DESCRIPTORS *Academic Achievement; *Class Size; Longitudinal Studies; Outcomes of Education; Performance; Primary Education; *Small Classes; *State Legislation; *Teacher Student Ratio
 IDENTIFIERS *California; *Student Teacher Achievement Ratio Project TN

ABSTRACT

Four initiatives to reduce class size are before the California State Legislature--SB 1414, AB 2449, the Governor's proposal, and AB 2821. Three of them were influenced by the findings reported by Tennessee's Project Student Teacher Achievement Ratio (STAR). Project STAR is a longitudinal demonstration project that since 1985 has examined the effects of reduced class size on student performance in grades K-3. This paper reviews the findings of STAR researchers, who reported that students in smaller classes showed marked improvement in academic performance. The paper reviews the literature on class size and discusses technical, implementation, and fiscal concerns about the STAR research findings. Specifically, some analysts have questioned whether the benefits of smaller classes significantly offset the costs incurred to create them. Another concern is whether classes with as few as 15 children are small enough to achieve marked improvements in performance, and whether those improvements persist over time. Finally, there are concerns about whether other reforms should accompany smaller classes in order to ensure consistent achievement gains. The paper suggests that the California state legislature may wish to consider other class-reduction options, such as coordinating funding for related projects, focusing on low-achieving schools first, and establishing a formal evaluation program to examine issues related to class-size reduction. The legislature might also consider options in lieu of smaller classes, including early-late classes, individual tutoring, comprehensive reform programs, and early childhood programs. One table is included. (Contains 29 references.) (LMI)

 * Reproductions supplied by EDRS are the best that can be made *
 * from the original document. *



EA

Reducing Class Size: A Review of the Literature and Options for Consideration

By David C. Ilig
California Research Bureau
California State Library

ED 407 699

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND
DISSEMINATE THIS MATERIAL
HAS BEEN GRANTED BY

D. Ilig

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)

BEST COPY AVAILABLE

7028267

Reducing Class Size: A Review of the Literature and Options for Consideration

By David C. Ilig
California Research Bureau
California State Library

Introduction

Currently, there are four class size reduction proposals before the Legislature. Table 1 compares these proposals. Three initiatives (SB 1414, Greene; AB 2449, Alpert; and the Governor's) are similar in that they propose either a reduction in class size or a reduction in student/teacher ratio to about 20 students, for either grades one through three or for kindergarten through grade three.

A fourth bill (AB 2821, Richter) provides that 95 percent of any funds appropriated for class size reduction should be distributed to school sites. This bill does not specify any class size goal. A fifth bill (AB 2700, Sher) provides an appropriation for facilities if legislation reducing class size is passed and signed by the Governor. This latter bill is not included in the side-by-side, because it does not propose a reduction in class size.

The Governor's proposal, along with SB 1414 and AB 2449, was motivated in part by the findings reported by the Tennessee Project STAR research team. Project STAR is a demonstration project that tested the effects of reducing class size on student performance. It was conducted for four years beginning in 1985. Subsequent to evaluation of the demonstration project, Tennessee has legislated a reduction in class size to no more than 18 students for kindergarten through grade two.

Other factors that will influence California's class size proposals include: fiscal considerations resulting from increased revenues from the improving economy; requirements of Proposition 98; and a general belief that smaller classes are better than large classes¹.

The Tennessee Study Showed Marked Improvement in Performance for Students In Smaller Classes

The Tennessee legislature, subsequent to an earlier set of education reforms², was considering a statewide initiative to reduce class size in 1983. One influential legislator with a research background raised concerns regarding whether class size of about 15 students would result in

¹ Annual "Scorecards" published by various organizations and the US Department of Education have, for at least the last decade, ranked California with some of the largest class sizes.

² Project STAR was conceived in the context of an already enacted set of comprehensive education reforms. These reforms included a new career ladder for teachers (with master teacher designations and merit pay) and a Tennessee Center for Excellence program (designed to provide incentives to universities in Tennessee to work toward better educational outcomes). Also, the legislature created a new skill-based early elementary curriculum called Basic Skills First. Finally, the legislature funded a class-size reduction demonstration project at one Nashville elementary school.

EA 028 267

consistent improvement in student achievement³. Thus, the legislature created Project STAR to test whether class sizes that averaged 15 students in kindergarten through grade 3 would result in improved student performance, when compared to class sizes that averaged 24 students. In order to determine whether the experiment was a success, the Tennessee Department of Education contracted with a consortium of public and private universities to conduct studies to track the success of children who participated in the demonstration project.

Experimental Design. The experiment required that children be randomly assigned to either a small size class (13 to 17 students), to a regular size class (22 to 25 students), or to a regular size class with a full-time aide⁴. During the first year, children were randomly assigned to the various class types when they entered kindergarten. Each subsequent year, new students were randomly assigned to one of the three groups. Teachers also were randomly assigned to one of the three class types.

Schools volunteered to participate in the project and agreed to abide by the rules of the demonstration. Seventy-nine schools were randomly selected from among the volunteers. These schools were divided into four geographic groups: inner-city, suburban, urban (small cities over 2,500), and rural. Two tests -- the nationally normed Stanford Achievement Test and the curriculum-based Tennessee Basic Skills First Test -- along with an "inventory" survey designed to identify student self-concept and academic motivation, were given at the end of each year to students who participated in the demonstration. In addition, several surveys and questionnaires were administered to participating teachers and school site administrators. These exams and surveys provided achievement and other data for various types of analyses. Three analyses were performed:

- Each year researchers tested children in the demonstration to evaluate performance. Annual comparisons were reported for each class type. In addition, comparisons were made for the four geographic groups, and by minority group, gender, and socioeconomic status.
- Roughly one-third of the children in the sample continued to participate in the same class type (small or regular class) for three or four years⁵. Data on these children were linked across school years to determine whether students in small classes made greater achievement gains than children in regular sized classes and whether those gains were cumulative.

³ The Tennessee Department of Education provided summaries of the research literature and other documents to the legislator for his review.

⁴ Thus, three basic comparisons were possible: comparisons of small to regular class, small to regular classes with aides, and regular classes to regular classes with aides. Since most regular classes and small classes had part-time teaching aides, the comparisons between the regular and small classes, and the two regular class types was, in fact, a comparison between a part-time and a full-time aide.

⁵ Kindergarten was not mandatory in Tennessee during the time of Project STAR, therefore some students completed four years in the same condition while others completed only grades 1-3.

- Follow-up studies were performed on an annual basis to determine whether achievement gains experienced at the lower grade levels persisted throughout grades four through eight.

Findings. The Project STAR research team reported several significant findings⁶, including:

- Children in small classes consistently out-performed children in large classes. The average achievement differential was about twice the amount expected based on estimates published in the literature⁷.
- At the end of third grade, students in small classes in inner city schools, on average, scored 18 points higher on the SAT Reading Test than did their counterparts in regular-sized classes. This compared to differences in suburban schools of +6 points, rural schools of +7 points, and urban schools of +4 points. Comparable differences also existed for the SAT Math Test.
- At the end of third grade, inner-city children (about 97 percent of whom are minorities⁸) in small classes performed less well than suburban, urban, or rural children; however, the inner-city children in small classes closed some of the performance gap between themselves and children in large classes elsewhere.
- Regular classes with full-time aides out-performed regular classes with part-time aides, but only in the first grade. Small classes, however, consistently out-performed both regular classes and regular classes with aides.
- Low income children (determined by eligibility for free/reduced price lunch program) did less well than other children regardless of location or class size.
- Children experienced all of their achievement gains during the first year in which they were enrolled in smaller classes. A subsequent study indicated that students who began their instruction in small-sized kindergarten classes, and who continued in smaller first grade classes, may have had a small additional achievement gain in the first grade.
- Students retained their achievement advantage over children in large classes in later years; however, there were no significant additional gains in subsequent years relative to the children in regular classes.

⁶ Performance or achievement means class average scores on the tests given at the end of each year. Performance differential or achievement gain means statistically significant differences in the average scores between the groups being compared.

⁷ Glass, et al 1982.

⁸ Minority students were almost exclusively African American. Latinos, Asians, and other minorities comprised less than 2 percent of the minority population in the demonstration.

- Follow up studies of students in the demonstration show that students from small classes continued to out-perform children from large classes through the eighth grade, although the difference by the eighth grade was quite small⁹.
- Children in small classes were less likely to be retained in grade.
- Children from small classes during kindergarten through grade three were more likely to participate in fourth grade classes.

Literature Review

A perception exists among parents and teachers that smaller classes are better than larger classes. Researchers and policy analysts, however, are more wary. Some researchers have technical concerns about the research designs of studies that report a relationship between reduced class size and improved achievement -- including the Project STAR study. Other studies address concerns that are based on the cost effectiveness or program design of smaller classes.

Analysts have raised several fiscal and implementation issues, including questions about whether the benefits of reduced class sizes are sufficient to offset the costs incurred to create them. These studies suggest that other strategies can be implemented to improve student performance at a lower cost. In addition, there are concerns about whether classes with as few as 15 children are small enough to achieve marked improvements in performance, and whether those improvements persist in subsequent years. Finally, there are concerns about whether other reforms, such as curriculum and teaching style changes and quality improvement mechanisms, should accompany smaller classes in order to assure consistent achievement gains.

Following is a discussion of the literature that drove the Project STAR demonstration project, as well as other literature that addresses other comprehensive reforms that can complement smaller classes¹⁰.

Researchers Had Different Thoughts About the Appropriate Size of Classes. The small class size of 15 students was chosen for Project STAR based on the work of a group of researchers headed by Gene Glass and Mary Lee Smith. These researchers used a statistical technique known as meta-analysis to determine an estimate of the relationship between class size and student achievement. The primary finding of the Glass-Smith analysis was that class size reduction improved student achievement, but that those improvements were relatively small for class sizes of 20 or more students. Student achievement was more significantly improved for classes that had fewer than 15 students¹¹.

⁹ It is important to note that the small class differential began declining after the first year children were in the small classes and by the fourth grade it was only about 50 percent of its value at the end of the first year.

¹⁰ This section relies on several recent reviews of the literature, including: Project STAR 1989, Odden 1989, Mitchell, et al 1989, Slavin 1990, Robinson 1990, Hanushek 1994, and Sadowski 1995.

¹¹ Glass, et al 1978.

Another research entity, the Educational Research Service¹² (ERS), challenged the Glass-Smith analysis on several grounds, including the reliability of the meta-analysis technique to predict appropriate class size, and the studies used by Glass-Smith to support its research¹³. By the early 1980's, however, the basic Glass-Smith results were widely cited in the literature. While these results are the basis for many policy initiatives, the debate has not been settled, and many researchers remain unconvinced about the Glass-Smith results.

A 1986 ERS report, using a different analytical technique, suggested that achievement gains are found in classes that enroll fewer than 22 students. Further, the report suggests that these results are most pronounced in early elementary classes (kindergarten through grade 3) and in classes containing mainly disadvantaged children. The ERS results have been challenged for many of the same reasons as those attributed to Glass-Smith.

Field Projects Complemented the Research Literature. In the early 1980s, as Project STAR was under development, researchers were reporting encouraging early results from a class-size demonstration project at one Nashville elementary school. In addition, another class-size experiment, Indiana's Project Prime Time¹⁴, was showing promising results. University researchers that were evaluating the Nashville demonstration project also were advocating Project Prime Time as one possible model for reducing class sizes in Tennessee. Follow-up studies of the Nashville experiment, along with later studies of Project Prime Time, reported that achievement gains made by children in smaller classes in the first year were not sustained in subsequent years of instruction. These studies, however, were published after Project STAR began.

A recent analysis of the Glass-Smith data by Robert Slavin¹⁵ challenges whether reducing classes to 15 students or less would actually improve performance¹⁶. As it turns out, when removing one study from the group used by Glass-Smith, the average effect for classes of about 15 students

¹² Educational Research Service 1980.

¹³ Summarized in Glass, et al 1982. See also Educational Research Service 1980, and Robinson and Wittebols 1986.

¹⁴ Project Prime Time was approved by the Indiana legislature in 1981 and began in the 1983-84 school year in 24 kindergarten through second grade classes. The demonstration tested class sizes at 14 students per teacher in a variety of schools.

¹⁵ Slavin 1989.

¹⁶ The Glass-Smith finding is derived from the use of statistical techniques to estimate a curve that is based on extrapolation from the results of 14 "well controlled" studies reviewed by the authors. Slavin's analysis examined the actual data underlying the Glass-Smith curve, and found that these data suggest much smaller gains than the gains based on the Glass-Smith estimates. Slavin also suggested that other studies could be excluded either because the study examined only short duration small classes (30 minutes), or the study examined post-secondary classes. Leaving these studies in the analysis, however, would not materially affect the results.

declined significantly¹⁷. Further, most of the large gains in achievement in the Glass-Smith analysis can be attributed to tutoring situations that had only 1 to 5 children.

Studies Also Identify Other Outcomes from Smaller Classes. In addition to achievement gains, researchers have reported other benefits that are attributed to smaller class size. For example, some of the Project STAR team reported that children in small classes were less likely to be retained than children in regular classes. They also found that fourth grade teachers reported more active participation from students who had previously been enrolled in smaller classes.

A different small class size evaluation conducted in Nevada¹⁸ suggests that children in small classes are less likely to be referred to special education. Researchers also have reported higher morale and less teacher stress for teachers who instruct classes with a smaller number of students. Another byproduct of smaller class size is that teachers report that they can move through their curriculum at a faster pace. In most of these instances the changes are small and are not always statistically significant. Nevertheless, such factors can be considered as benefits to class size reduction. In addition, to the extent that these nonachievement outcomes of smaller classes reduce costs over time, they could be considered in policy discussions.

Does Money Matter? Many policy analysts have used the research noted above to debate whether the benefits derived from reducing class size are greater than their cost. Much of the literature on this topic, however, does not provide enough information to determine whether money does or does not matter, or under what conditions money does matter. Studies typically focus on broad averages, across many types of school sites, and often lead to very different conclusions. For example, a recent article in the Harvard Education Letter¹⁹ used a demonstration project in Austin, Texas to show how different analytical techniques could yield contradictory conclusions. In the Austin demonstration, 15 poorly performing elementary schools were given \$500,000 each per year for five years, and were directed to improve student performance. Each school used some of its funds to reduce class size; yet, only two schools showed improvements. One analysis (counting successes and failures) would suggest that money didn't matter, in that 13 schools did not improve student performance. Conversely, another analysis, one that focuses on average gain in student achievement across sites, might show that the two exemplary schools compensated for those schools that did not succeed; thus, money did matter.

The real significance of the Austin demonstration to policy makers is that it suggests the need to compare improved schools to those that did not improve. What the authors found is that the improved schools markedly changed the way teachers taught in the smaller class settings. This

¹⁷ The study Slavin excluded was an experiment that tested whether class size affects motor skill training. The achievement test used in the experiment consisted of rallying a tennis ball off a wall for a specified period of time.

¹⁸ Snow 1993.

¹⁹ Sadowski 1995.

example emphasizes the need to examine what is occurring at each test site rather than merely relying on averages to drive policy formation.

The class size debate is both more subtle and more complex than just reducing class size. Recently, one researcher from Harvard, Richard Murnane, stated that asking whether money matters is the wrong question. Instead, he suggests that policy makers should identify student performance goals, along with a set of strategies for achieving those goals. He suggests that policy makers should then determine how funds can be used to support the achievement of their goals²⁰.

Discussion

The Project STAR research findings are impressive; nevertheless, there remain important concerns about them. In addition, there are numerous issues that will be necessary to resolve before smaller classes in California can be implemented.

Technical Issues. The researchers who conducted the evaluation of Project STAR did not adequately discuss potential problems with their evaluation design, or how those problems might affect the study's results²¹. Other researchers who have used the data from the Project also have identified technical issues. Some of these technical problems could reduce the significance of the results for California. Nevertheless, some reviewers seem to think that the main results of the Tennessee project are valid. However, since other recent demonstrations around the country have *not* shown results as dramatic as those found in Tennessee, any evaluation regarding the effects of class size reduction on student performance should be viewed with caution.

²⁰ The Project STAR team and other researchers also suggest that class size reductions should be accompanied with other changes including changes in teaching style. Some of these changes may evolve naturally when classes are smaller; but these changes cannot be assumed. A recent book published by the Brookings Institute draws similar conclusions (Hanushek 1994). This book summarizes the work of a prominent group of education economists with diverse backgrounds. It supports the notion that smaller classes must be imbedded in more comprehensive reforms.

²¹ Some of the concerns mentioned in the Project STAR report also have been identified by other researchers. Issues that could affect the results include: (1) removal of 108 children from small classes and reassigning them to regular or regular with aide classes; (2) three schools dropped out of the experiment at first grade and another dropped out at second grade (two were inner city schools, one was an urban school and one was either a suburban or rural school); (3) comparisons between the regular and regular with aide classes are affected by regular classes having part-time aides; (4) schools and teachers in the study were chosen from among schools and teachers that volunteered; thus, may not be representative; and (5) attrition from the sample at all schools and for all class types was significant and as the report suggests the children who remained for the entire study may not be representative. Other researchers have noted that the manner of random assignment inadvertently may have led to relatively more low achievers in the large classes while distributing the high achievers more equally between the large and small classes.

Implementation Issues. Implementing smaller classes in California is likely to be more complicated than was true for the Tennessee demonstration. Following are several considerations that should be addressed when considering the Tennessee model:

- What happens when a state has a more diverse school population, like that which exists in California?
- How would class size affect limited English speaking children? There is no analysis in the Project STAR reports of children with limited English capability.
- How would other school reform initiatives have affected the Project STAR results? For example, Tennessee introduced an elementary school program called Basic Skills First prior to the Project STAR initiative. Also, schools in Tennessee, at the time Project STAR was implemented, had much lower student-teacher ratios than those that exist currently in California.
- How critical is staff development and training in developing small class teaching skills? The Tennessee report indicated that their training program had little effect on student achievement. Nevertheless, most researchers believe that training in small class teaching techniques is an important component of reducing class size. It is important that there be a good understanding of what constitutes effective training. One of California's recent proposals to reduce class-size includes a mandatory training component.

Fiscal Implementation Issues. There are three fiscal issues that should be addressed regarding the implementation of smaller classes in California.

- One issue is whether school districts have the means by which to fund additional physical infrastructure needed to accommodate smaller classes. The Greene and Sher bills address this issue; the Governor's proposal does not.
- Another issue is whether funding proposals for staff and other needs is sufficient. Some informal analyses indicate that the existing proposals could require school districts to fund up to half of the cost associated with class size reduction; others suggest that these proposals could require school districts to fund more than half.
- A final issue is whether there will be enough teachers to staff additional classes. Some school districts now rely on emergency credentials in order to staff existing classes. Increasing the demand for teachers is likely to further exacerbate current shortages, and could affect teacher salaries.

Options

There is much we do not understand about the effects of smaller classes. The legislature may wish to consider a number of other options for reducing class size, as well as options in lieu of

smaller classes. In addition, there are reforms that have shown promise that deserve consideration.

Begin with K-1. The Project STAR longitudinal study strongly suggests that virtually all achievement gains made by students in the small classes occur in either kindergarten or first grade. When considering the current California proposals, it is important that special consideration be given to enrolling children in small classes, preferably beginning with kindergarten.

Coordinate Funding for Related Projects. The Governor's May Revision includes funding for a Reading Initiative²², as well as for other increases in school funding. Federal Chapter 1 compensatory education funds also are available at many school sites. The reading initiative, compensatory education, and several other categorical programs²³ address goals that include improving student achievement. The legislature may wish to consider intent language that clearly states that these initiatives and programs should be coordinated with class size reduction efforts.

Focus on Low Achieving Schools First. One of the more dramatic findings in the Project STAR reports is the relatively large achievement gain for children in small inner-city classes, when compared to children in small classes elsewhere. Research has shown that schools with disproportionately large numbers of minority and low socio-economic status children also are more likely to be low performing schools. Thus, the legislature may want to target low-performing schools for class size reductions.

Evaluation and Research. The legislature may wish to establish a formal evaluation program that would examine issues related to reducing class size²⁴. In order for such a program to be effective and to provide useful information, it should be distinct from State Department of Education school district reporting programs. It should be focused on evaluating student achievement, performance, and other outcomes.

This evaluation program should be on going and include several components. Among these are: (1) oversight by an advisory group drawn from state agencies such as the Legislative Analyst, State Department of Education, California Research Bureau, Department of Finance, and an outside group of prominent academic researchers with evaluation experience; (2) comprehensive implementation evaluations (sometimes called process studies) so useful information can be gathered about how schools implement small classes; (3) establishment of an on going statewide representative sample of children so researchers can conduct longitudinal studies of progress through school and into adult life; and (4) detailed analyses of the internal workings of "good" implementations so that best practices information can be shared with other schools. The products of these studies could provide valuable information about future education needs, and could result in more informed policy development.

²² The reading initiative includes funds for a new curriculum stressing reading skills, staff development, and materials.

²³ These include: desegregation funds, economic impact funds, Healthy Start funds, and special education funds.

²⁴ The Governor's class size reduction proposal includes an evaluation component and it could be a component of the evaluation needs discussed in this paragraph.

Consider Other Options. The legislature may wish to give schools flexibility to use their class size reduction funds to test other strategies. In many cases, schools have some authority to do this; but for a variety of reasons schools are unable or reluctant to implement new strategies.

- **Early-Late Classes.** One strategy for providing smaller classes is to have part of the class arrive at school an hour before the remaining students. At the end of the day the "early arrival" students go home and the "late" arrivals remain for an hour in a smaller class setting. These early-late class structures are already used by many schools in California to give teachers an opportunity to work with small (about 15 children at a time) groups, primarily for reading. The Governor's proposal contemplates the use of this option in some schools.
- **Individual Tutoring.** Some studies show that one-on-one or small group tutoring sessions improve student achievement. Some researchers suggest that using short tutoring sessions that "pull out" poor performing students, to assist them in their reading or math, may be a cost-effective way to achieve some or all of the benefits of smaller classes. Additional teachers or specialized aides may be needed for such a program; however, tutoring may result in lower overall costs than small classes for all students.
- **Comprehensive Reform Programs.** There are many comprehensive education reform proposals designed to improve student achievement at school sites with large numbers of disadvantaged children. One program, called **Accelerated Schools**, was developed by Henry Levin and associates at Stanford University's School of Education²⁵. Their program combines several elements that focus on the educational success for all students. There are three principles to this program: build on the strengths of students; empower the school site to determine how best to improve student performance; and achieve a unity of purpose. This is accomplished in Accelerated Schools by setting high expectations, creating a results-based planning process, involving parents, and eliminating remedial classes. Levin and associates report that children in these schools have achieved beyond grade level.

Another example of a comprehensive program is **Success for All**. This reform effort shows promising results for inner-city schools²⁶. Like the Accelerated School program, Success for All focuses on strengths rather than deficiencies. It also stresses prevention rather than remediation. The program uses reading tutors, a special reading curriculum, and frequent reading assessments. Success for All schools also have preschools and kindergartens where a specialized learning curriculum is used. Many Success for All schools also have family support teams that work with children and families in conjunction with school staff. This program stresses quality reviews and staff development. Evaluations of Success for All show significant gains for participating schools.

²⁵ Levin 1993.

²⁶ Madden, et al 1993.

- **Early Childhood Programs.** Early childhood programs consist of a variety of intensive developmental child care and preschool models that have been evaluated, and that exhibit promising outcomes. These programs generally last for between two and five years, and end when a child enters kindergarten. Various program models share several characteristics, including: a high quality curriculum for children; a home visiting component with clear and consistent objectives; a review process that focuses on quality improvement; and an emphasis on a family's strengths, rather than its deficiencies. Evaluations of some of these programs show promising results²⁷.

²⁷ These studies are summarized in several review articles published in Long-Term Outcomes of Early Childhood Programs, a special issue of The Future of Children, Center for the Future of Children Vol. 5 No. 3 (Winter 1995) and Home Visiting, a special issue of The Future of Children Vol. 3 No. 3 (Winter 1993).

BIBLIOGRAPHY

- Achilles, Charles, "Response: Students Achieve More in Smaller Classes," 53 Educational Leadership (February 1996)
- Bain, Helen and C. M. Achilles, "Interesting Developments in Class Size," Phi Delta Kappan (May 1986)
- Connor, Kim and Rosemarie Day, "Class Size: When Less is More," Senate Office of Research, California Legislature, Sacramento (February 1989)
- Educational Research Services, Class Size Research: A Critique of Recent Meta-Analyses, Corporate Author, (Arlington, VA) 1980
- Finn, Jeremy and Charles Achilles, "Answers and Questions About Class Size: A Statewide Experiment," 27 American Educational Research Journal (Fall 1990)
- Finn, Jeremy, DeWayne Fulton, Jayne Zaharias, and Barbara Nye, "Carry-Over Effects of Small Classes," 67 Peabody Journal of Education, (Fall 1989, published 1992)
- Glass, Gene and Mary Lee Smith Meta-Analysis of the Relationship of Class Size and Student Achievement San Francisco, Far West Laboratory for Educational Research 1978
- Glass, Gene, Leonard Cahan, Mary Lee Smith, and Nikola Filby, School Class Size: Research and Policy Sage Publications (Beverly Hills, London, New Delhi) 1982
- Hanushek, Eric, "The Economics of Schooling: Production and Efficiency in Public Schools," 24 Journal of Economic Literature (September 1986)
- Hanushek, Eric, with other authors, Making Schools Work: Improving Performance and Controlling Costs, The Brookings Institution (Washington D.C.) 1994
- Hanushek, Eric, "Money Might Matter Somewhere: A Response to Hedges, Laine, and Greenwald," 23 Educational Research (May 1994)
- Hedges, Larry V., Richard Laine, and Rob Greenwald, "Does Money Matter? A Meta-Analysis of Studies of the Effects of Differential School Inputs on Student Outcomes," 23 Educational Research, (April 1994)
- Levin, Henry M., "The Economics of Education for At-Risk Students," in Emily P. Hoffman, ed., Essays on the Economics of Education, W.E. Upjohn Institute (Kalamazoo, MI) 1993
- Maddan, Nancy, Robert Slavin, et al, "Success for All: Longitudinal Effects of a Restructuring Program for Inner-City Elementary Schools," 30 American Educational Research Journal, (Spring 1993)
- Mitchell, Douglas, Cristie Carson, and Gary Badarak, How Changing Class Size Affects Classrooms and Students California Educational Research Cooperative, University of California at Riverside (May 1989)
- Mitchell, Douglas, Sara Ann Beach, and Gary Badarak, "Modeling the Relationship Between Achievement and Class Size: A Re-Analysis of the Tennessee Project STAR Data," 67 Peabody Journal of Education (Fall 1989, published 1992)

- Mosteller, Frederick, "The Tennessee Study of Class Size in the Early School Grades," 5 The Future of Children (Summer/Fall 1995)
- Nye, Barbara, et al, "The Lasting Benefits Study: Grade 6 Technical Report," Center of Excellence for Research in Basic Skills, Tennessee State University 1993
- Nye, Barbara et al, "The Lasting Benefits Study: Eighth Grade Technical Report," Center of Excellence for Research in Basic Skills, Tennessee State University 1995
- Odden, Allan "Class Size and Student Achievement: New and Affordable Strategies That Make Sense," School of Education, USC, Report for the California Department of Education (May 1989)
- Robinson, Glen, "Synthesis of Research on the Effects of Class Size," 47 Educational Leadership 1990
- Robinson, Glen and J. H. Wittebols, Class Size Research: A Related Cluster Analysis for Decision Making, Educational Research Service (Arlington VA) 1986
- Sadowski, Michael, "The Numbers Game Yields Simplistic Answers on the Link Between Spending and Outcomes," 11 The Harvard Education Letter (March/April 1995)
- Slavin, Robert E., "Class Size and Student Achievement: Small Effects of Small Classes," 24 Educational Psychologist, (1989)
- Slavin, Robert, "Class Size and Student Achievement: Is Smaller Better?" 62 Contemporary Education (Fall 1990)
- Snow, Mary, The 1993 Class Size Reduction Evaluation Study Nevada Department of Education (August 1993)
- Tillitski, Christopher, "The Longitudinal Effect Size of PRIME TIME: Indiana's State Sponsored Reduced Class Size Program," 62 Contemporary Education (Fall 1990)
- Tomlinson, Tommy, "Class Size and Public Policy: The Plot Thickens," 62 Contemporary Education (Fall 1990)
- Word, Elizabeth, Director, et al, "Project STAR Final Report, 1985-1990," Tennessee State Department of Education, 1990

Table 1: Comparison of Class Size Reduction Proposals Before the Legislature

	SB 1414, Greene As amended May 29, 1996	AB 2449, Alpert As amended May 30, 1996	Governor's Proposal	AB 2821, Richter As Introduced May 16, 1996
Grades:	grades 1 through 3	kindergarten through grade 3	kindergarten through grade 3	
Class size:	20 children per certificated teacher	20 children per certificated teacher	<ul style="list-style-type: none"> • 20 children per classroom • 20 children per teacher in larger classrooms 	
Funding:	<p>\$500 per unit of enrollment in affected classes, appropriates \$238 million to implement grade 1.</p> <ul style="list-style-type: none"> • Subsequent year appropriations from Budget Act to continue grade 1 and implement remainder of program. • Establishes "first come-first served" allocation of funds should Budget Act not provide sufficient funds for all schools. 	<p>\$500 per unit of enrollment in affected classes. Expresses intent that funding for this program be included in Budget Act</p> <ul style="list-style-type: none"> • Specifies funding only for kindergarten and grade 1 in first year • Funding only for kindergarten and grades 1 and 2 in second year • Funding for kindergarten through grade 3 after second year. 	<p>\$500 per unit of enrollment in affected classes if establish new classroom</p> <p>\$250 per unit of enrollment in affected classes if reduce student-teacher ratio within existing classes.</p> <ul style="list-style-type: none"> • Funding for grades 1 and 2 in FY 1996-97; and for K through 3 in subsequent years. • Establishes pro rata reduction in allotment for class size reduction in years when Budget Act or other legislation provides insufficient funds for full implementation. 	Expresses intent that "blank" funds be appropriated in 1996 Budget Act and in future Budget Acts.

<p>Other:</p>	<ul style="list-style-type: none"> • Repeals Language Arts Enrichment Program. • Amends Leroy F. Greene State School Building Lease-Purchase Act to allow construction pursuant to class size reduction provisions. • Repeals State Board of Education class size waiver authority. • Urgency Clause. 	<ul style="list-style-type: none"> • Repeals Language Arts Enrichment Program. • Amends Leroy F. Greene State School Building Lease-Purchase Act to allow construction pursuant to class size reduction provisions. • Urgency Clause. 	<ul style="list-style-type: none"> • Participating schools must provide training from existing funds to teachers on how to maximize the educational advantage of small classes. • Schools that choose to implement small classes using an early-late school day must ensure that all students attend school for at least the minimum amount of time per day. • Requires SDE to evaluate small class initiative. • Repeals State Board of Education class size waiver authority • Amends Leroy F. Greene State School Building Lease-Purchase Act to allow construction pursuant to class size reduction provisions. 	<ul style="list-style-type: none"> • Intent that all schools would be eligible for class size reduction program. • Creates 1996 Class Size Reduction and Quality Improvement Program. • Any class size reduction funds appropriated in Budget Act must be distributed to school districts pursuant to rules adopted by State Board of Education. • School Boards must provide school sites with at least 95 percent of any funds appropriated pursuant to approved planning process. • Urgency Clause.
----------------------	---	--	--	---



REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: <i>Reducing Class Size - A Review of the Literature and Options for Consideration.</i>	
Author(s): <i>David C. Illig</i>	
Corporate Source: <i>California Research Bureau California State Library</i>	Publication Date: <i>June 1996</i>

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education (RIE)*, are usually made available to users in microfiche, reproduced paper copy, and electronic/optical media, and sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following two options and sign at the bottom of the page.



The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

_____ *Sample* _____

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 1

The sample sticker shown below will be affixed to all Level 2 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY

_____ *Sample* _____

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2



Check here For Level 2 Release: Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical), but not in paper copy.

Check here For Level 1 Release: Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical) and paper copy.

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at Level 1.

"I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries."

Sign here → please

Signature: <i>David C. Illig</i>	Printed Name/Position/Title: <i>David C. Illig Senior Policy Analyst</i>
Organization/Address: <i>California Research Bureau California State Library P.O. Box 942837 Sacramento CA 94237-0000</i>	Telephone: <i>(916) 967 0224</i> FAX: <i>(916) 654 5829</i>
	E-Mail Address: <i>dillig@library.ca.gov</i> Date: <i>6/13/97</i>

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor: <i>California Research Bureau, CA State Library</i>
Address: <i>PO Box 942837 Sacramento, CA 94237-0001</i>
Price: <i>Individual Copies are free</i>

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse: ERIC Clearinghouse on Educational Management College of Education 5207 University of Oregon Eugene, OR 97403-5207

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
1100 West Street, 2d Floor
Laurel, Maryland 20707-3598

Telephone: 301-497-4080

Toll Free: 800-799-3742

FAX: 301-953-0263

e-mail: ericfac@inet.ed.gov

WWW: <http://ericfac.piccard.csc.com>

(Rev. 6/96)