

Class Size Reduction

by Basha Krasnoff

The federal government has fully supported class size reduction (CSR) to improve student achievement, with funding for the initiative reaching \$1.3 billion by 2000. In 2002, a class size reduction program was embedded into Title II of the No Child Left Behind Act when the Eisenhower Professional Development Grant and the Class Size Reduction Grant were consolidated into a more general teacher quality block grant program funded at \$2.85 billion.

The Title II “Improving Teacher Quality” State Grant provides funding for professional development; recruiting, hiring, and training new teachers; and reducing class size. All three of these are prominent topics in K–12 school improvement and each one warrants study. Some analysts argue that no education issue would benefit more from research-based evidence than CSR. CSR is very expensive to implement and there has been much debate over whether its benefits are sufficient to offset the high costs because implementing CSR often precludes investing in other improvement strategies (Council of Chief State School Officers, Research and Development, 2012).

A popular strategy

CSR is a very attractive educational improvement strategy and popular with parents and educators alike. Parents believe that smaller classes mean greater attention to individual student’s needs leading to better student learning. Teachers believe that smaller classes are more manageable and allow time for thoughtful reflection on instructional practice, which they assume will lead to higher achievement. By 2005, approximately half of the states had either mandated or provided incentives to reduce class size in public schools despite scant evidence of its effectiveness (Chingos, 2011). By 2010, all but 15 states had laws restricting the number of students that may be included in a general education classroom in some or all grades (Sparks, 2010).

CSR studies have always produced somewhat ambiguous results. When critics challenged CSR, however, it wasn’t because they had no effect on student achievement but rather, they weren’t considered the best use of educational

funds (Sparks, 2010). Despite this concern about cost effectiveness, smaller class size remained a popular concept. According to a 2007 survey conducted by the American Federation of Teachers, parents considered class size second in importance only to school safety (Dillon, 2011). One national poll found that 77 percent of Americans would rather spend educational dollars on class size reduction than on higher teacher salaries (Chingos, 2011).

With the economic downturn beginning in 2008, however, many states and districts began to consider that their investment in CSR might be too costly in times of economic uncertainty. Consequently, 19 states relaxed or eliminated their class size laws or policies. Policymakers and researchers began to turn away from straight CSR to other methods of increasing individual instruction time, such as restructured class formats, coteaching, and distance learning. Federal policy has also begun to deemphasize class size reduction as an across-the-board policy. According to data from the American Association of School Administrators, 62 percent of districts in 2010/11 claimed they would increase class sizes, compared to 26 percent in 2009/10, and only 9 percent in 2008/09 (Ellerson, 2010).

Quality of available research

States and districts are searching for evidence of sufficient effectiveness of CSR policies to offset the expense of implementation. There are hundreds of studies, articles, and briefs on the topic. According to the Brookings Institute Brown Center on Education Policy, there are three categories of credible studies of CSR (Chingos & Whitehurst, 2011):

- Randomized experiments, in which students and teachers are randomly assigned to smaller or larger classes
- Natural experiments in which, for example, a sudden change in class size policy allowed a before-and-after analysis of its effects
- Sophisticated mathematical models for estimating effects that take advantage of longitudinal data on individual students, teachers, and schools.

Meta-analyses of the large array of existing studies suggest that research supports all possible standpoints: That CSR improves student performance, that CSR can either improve performance or have no effect, and that CSR has absolutely no effect on student performance. With these conflicting study outcomes, there are mixed opinions on whether class size has any discernible effect on student achievement and whether discernible benefits outweigh the costs of implementation. There is one conclusion that research on the topic of CSR can agree on: There is no reason to expect consistent improved student performance under a CSR policy.

Unfortunately, the body of research on the impact of CSR on student achievement has been highly criticized on the basis of flawed methodologies and results challenged as unreliable. The most common failing of such research is disregard for the impact of other student variables on student achievement, such as income level. Also problematic is the lack of research comparing CSR directly to other interventions, in order to determine which strategy is *more* effective.

“Credible” study results

There are only three high-quality, research-based studies that have actually investigated the impact of smaller classes on student performance. The first two have historical significance because much of what is currently believed about CSR originated with them: the STAR study in Tennessee and the SAGE program in Wisconsin. The third study, the California CSR program study, provided many lessons for proponents of current and future programs (Romanik, 2010).

Tennessee STAR

The most influential and credible study of CSR initiatives is the Student/Teacher Achievement Ratio (STAR), conducted between 1985 and 1989 and involving 79 elementary schools. Project STAR is frequently cited as a landmark study in CSR research and is credited with much of the national push in CSR. Project STAR is unique for being both large-scale and randomized—two characteristics that are considered the gold standard in social science research.

This study randomly assigned students to kindergarten classes so that some were enrolled in regular classes composed of 22–26 students and others went into small classes of 13–17 students. Students remained in these class configurations through third grade. When studied in grade 3, students in the smaller classes saw larger test scores gains in reading and mathematics compared to those in larger classes. This effect was most noticeable for minorities and low-income students. These benefits were reported to extend into the upper elementary grades. The advantage of CSR appeared greater (nearly double) for African American students compared to nonminority students. Poor and minority students appeared to reap the greatest learning gains in smaller classes. Classroom behavior was judged better for students enrolled in small classes, and these students were more likely to take college entrance exams during high school. Follow-up studies through the years found the students who had been in small classes earlier had better academic and personal outcomes throughout their school years and beyond (Krueger & Whitmore, 2001; Sparks, 2010).

STAR has been recognized as demonstrating some of the largest CSR impacts: Students gained the equivalent of three additional months of schooling four years after their classes were reduced by 7–10 students. It is important to note that in order to see the benefit, class sizes must fall to 15 students or fewer, compared to an average class size of 24 students. Most research agrees that slight class size reductions bear no measurable benefit for students (Achilles, 2012).

Wisconsin SAGE

The Student Achievement Guarantee in Education (SAGE) program in Wisconsin began in 1996. This study did not use randomization of students into regular and small classes but rather matched control and experimental schools. Variables used to match schools included family income, reading achievement, size, and racial composition. The CSR intervention started in

Speculations on the Benefits of Class Size Reduction

- Higher morale and less teacher stress
- Reduced teacher workloads
- More individualized attention for students
- Increased student and teacher interaction/communication
- Higher levels of student participation
- More time on task or greater opportunity to learn
- Lower student retention rates
- Increased parent and teacher interaction/communication

first grade and continued as students advanced to grades 2 and 3. The program continued for five years through 2001/02. Students were tested in May and again in October each year using the Terra Nova Comprehensive Test of Basic Skills. Results indicated that students in classes with approximately 15 students outperformed those in classes composed of approximately 30 students in mathematics and language arts each year the program was in existence. Researchers found higher achievement for children living in poverty. They also suggested that it would be difficult to replicate these results without including key elements of that program, such as early intervention and small class sizes for three years or more (Achilles, 2003).

California CSR

California's CSR program, the first large-scale, state-operated effort, was initiated during a time of plentiful state funding (Bullwinkle & Gaylor, 2002). It is actually not an experiment but rather a program with provisions for evaluation. CSR was introduced in kindergarten through third grade during fall 1996 and limited participating classrooms to 20 students. Initially, the state awarded districts \$650 to \$850 per student and facility grants of \$25,000 to \$40,000 per school to reach the reduced class size. During 1997/98 or the second year of operation, 1.6 million students were enrolled in small classes at an annual cost of \$1.5 billion (Witte, 2000). Over the lifetime of the reform, the state has spent an estimated \$22 billion in direct subsidies to districts participating in the program. This funding is in addition to billions of dollars spent by individual school districts in order to cover the costs of the reform (Freedberg & Cabrera, 2009).

A study of the program during 1998/99 included 432 California schools and found, in general, no difference on Stanford Achievement Test scores between groups of students who had participated in smaller classes and those enrolled in regular sized classes. Although the program has been very popular among teachers, parents, and students, it has resulted in relatively small positive achievement gains among K–3 students.

Policy considerations

According to Biddle and Berliner (2002), attention to class size is a timely and appropriate focus for education policy. Reducing class size makes intuitive sense: Decreasing the teacher-student ratio should increase teacher-student interaction, which together should increase student learning. And, some research indicates that smaller classes are good for learning and for behavior. But, research does not point to a straightforward relationship between decreasing class size and increasing student achievement. Rather, research suggests that there are many intervening factors that influence the outcome of implementing a CSR policy. There is a picture emerging that suggests the following:

- **Targeted population:** If minority and low-income students in the primary grades benefit the most academically and behaviorally from CSR policies, then funding considerations should be given to hiring well-trained and enthusiastic teachers and creating additional classroom space to accommodate smaller classes for this group.



In order for smaller classes to pay real dividends, both new and veteran teachers will need support in adopting teaching strategies that take advantage of the class size reductions.

- **Teaching skills:** New teachers and experienced teachers alike will need support to learn teaching strategies that optimize the benefit of a smaller classroom configuration. No intervention, including smaller classes, can succeed without good teaching practice.
- **Physical space:** Schools have only so much physical space. Dividing classrooms in half, using broom closets, and other makeshift accommodations are inadequate for obtaining optimal results of smaller class sizes. Proper facilities are a major consideration for implementing smaller classes.
- **Flexibility:** Any new policies that are instituted to reduce class size must be flexible enough to keep the focus on improved learning. Funds must be used to accommodate specific needs of specific students in specific schools and to engage the community in the planning process.
- **Expanding research base:** Rigorous research and evaluation of each CSR implementation will contribute to the success of subsequent implementations that are built on previous experience.

Theories about why small classes produce positive effects follow two lines of thought. Most theorists have focused on the teacher and have reasoned that small classes produce positive effects in student achievement because interactions between the teacher and individual students are improved in the small-class context. The theory suggests limits for the extra gains one should expect from small classes in the early grades. Clearly, students are likely to learn more and develop better attitudes toward education if they are exposed to well-trained and enthusiastic teachers, appropriate and challenging curricula, and physical environments in their classrooms and schools that

support learning. If conditions such as these are not also present, then to reduce class size in the early grades will presumably have little impact. Thus, when planning programs for reducing class size, states and districts should also plan for the professional development of teachers who will participate in smaller classes and provide appropriate environments in which those programs will take place.

Summary of findings

While individual studies have not offered conclusive evidence, the entire range of studies suggests a number of general conclusions about the effects of smaller classes on student performance:

- Long-term exposure to small classes in the primary grades is advantageous to all students, boys and girls equally
- Small classes in the primary grades offer particular academic and behavioral advantages to minority and low-income students whose gains increase the longer they are exposed to smaller classes
- Academic gains from small classes in the primary grades are larger when class size is reduced to fewer than 15 students
- Academic gains from small classes in the primary grades are found in multiple academic subjects using both traditional student achievement measures and various other indicators of student success
- Academic gains from small classes in the primary grades are retained when students return to standard-size classes in the upper grades and the gains continue through middle school and high school
- Evidence of academic improvement from smaller classes in middle school and high school has been inconclusive

Lessons learned

Researchers agree that shrinking the number of students in a class does not automatically translate into better learning. Teachers also need to alter their teaching practices to optimize the advantage of having fewer students. And, while the studies that found positive effects from CSR have focused on efforts that reduce classes to 16 or so students, the costs are prohibitive. Consequently, states have tended to reduce classes by only a few students. One concern surrounding various states' efforts to shrink class sizes is that the press for quantity will come at the expense of quality, forcing schools and districts to hire underqualified or unprepared teachers: a lesson that California learned firsthand with its CSR program. In the first year of its implementation, more than one fifth of the teachers hired had only emergency credentials. The schools serving poor and minority students were hit hardest as qualified teachers with full credentials and seniority left to take jobs at "less difficult" schools.

Offering an economist's view of class size research, Krueger (2000) maintains that there are significant advantages to be realized by maintaining small (<15) classes in the early grades, and that CSR would have a definite positive impact if targeted toward those populations shown to benefit from it, particularly students in high-poverty districts.

Krueger also notes that no commentators reach the conclusion that *increasing* class sizes will lead to improved student performance, save for possibly in the very upper grades of secondary schooling. However, participation in moderately sized classes (20–25 students) has not been shown to detrimentally affect students in and of itself. In fact, it is argued that students suffer the effects of a large class only when class sizes reach the 30s, just as reduction in size does not necessarily bring positive outcomes unless the number of students drops to 15 or fewer. Krueger's analysis concludes that reducing class sizes from the 30s to the 20s is in the right direction, but there is little support for the claim that there are increases in achievement or satisfaction, or teacher attitude or morale. Only when the class size reduces to 15 or fewer are there appreciable benefits.

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To learn more



Basha Krasnoff
Basha.Krasnoff@educationnorthwest.org
Research and Development Advisor
503.275.9624



Melinda Leong
Melinda.Leong@educationnorthwest.org
NWCC Washington State Coordinator
503.275.9172



Mike Siebersma
Mike.Siebersma@educationnorthwest.org
NWCC Director
503.275.9642

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