

Class Size and Student Performance Literature Review

In the following report, we explore the impact that class size can have on student performance, as evidenced by rigorous and reliable research. We find that few such studies exist, and opinions are ultimately mixed on whether class size has any discernible effect on student performance. We briefly look at class size under current budgetary constraints. Finally, we examine the class size reduction efforts of two school districts, followed by an examination of recent gains in student achievement at two large urban districts with class size reduction initiatives in place.

Introduction

Class-size reduction (CSR) initiatives have been a staple of education reform for several decades. However, given a climate of tightening budgets following the global economic crisis beginning in 2008, many states and districts can no longer afford to maintain widespread CSR programs. According to data from the American Association of School Administrators (AASA), **62 percent of districts in 2010-2011 claimed they would increase class sizes** compared to 26 percent in 2009-2010, and only 9 percent in 2008-2009.¹ This recent upward trend in average class size increases has led many researchers and school administrators to re-examine the issue of student achievement and class size.

Although CSR is a prominent subject in K-12 school improvement, **high-quality, evidenced-based studies are difficult to find**. According to the Brookings Institute Brown Center on Education Policy:²

...credible studies of CSR have utilized either 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 allows a before-and-after analysis of its effects; or sophisticated mathematical models for estimating effects that take advantage of longitudinal data on individual students, teachers, and schools.

The following report further explores the research on class size reduction and student achievement, despite its largely flawed nature. We find studies support 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. We additionally examine the importance of CSR as an educational reform in a time of budgetary crisis. Finally, we will examine four districts in terms of educational reform and class size reduction.

First, we present our key findings:

- ❖ The idea of reducing class size is popular. Most associate smaller classes with more personalized attention, which leads to better student learning. Additionally, there is some benefit to CSR in that stakeholders can “see” the

¹ Ellerson, N. 2010. “How America’s Public Schools Continue to Feel the Impact of the Economic Downturn.” American Association of School Administrators, p. 4.

http://www.aasa.org/uploadedFiles/Policy_and_Advocacy/files/CliffHangerFINAL.%281%29.pdf

² Whitehurst, G. et al. “Class Size: What Research Says and What it Means for State Policy.” Brown Center on Education Policy, Brookings Institution, May 11, 2011.

http://www.brookings.edu/~media/Files/rc/papers/2011/0511_class_size_whitehurst_chingos/0511_class_size_whitehurst_chingos.pdf

- intervention in real time—a parent or administrator walks into a classroom and can immediately recognize progress.
- ❖ If research on the topic of class size reduction can agree on one conclusion, it is that there is no reason to expect consistent improved student performance under a CSR policy. Some research finds positive outcomes, and some finds statistically insignificant differences in student performance between large and small classes.
 - ❖ Unfortunately, the body of research undertaken on the topic has been highly criticized for having flawed methodologies, making it unreliable. The most common failing of such research is disregard for the impact of other student variables, such as income level, in student achievement. Also problematic is the lack of research comparing CSR directly to other interventions, in order to determine what the *more* effective strategy may be.
 - ❖ CSR is challenged as being too costly in a time of economic uncertainty. According to a recent survey, 62 percent of school districts nationwide were expecting to increase class sizes in 2010-2011. Critics challenge CSR, not for having no effect on student achievement, but for not necessarily being the best use of educational funds. Proponents of CSR, however, hold that reducing class sizes results in cost savings, which can make up for the expense of implementation.

Class Size and Student Achievement

Led by the belief that smaller classes necessarily precede increases in student learning, for years states mandated or incentivized class size reduction initiatives in their public schools. Many still do. However, the cost of maintaining small classrooms in a time of budget constraints has not gone unnoticed. **Class size is one of few variables which can both impact student learning and can be mandated through policy**, making it an attractive topic for exploration. Additionally, class size reduction initiatives can serve to pacify a basic need to *see* efforts to increase student learning in action, whether or not they actually produce measurable results; as a New York Times article states, the obsession with class size stems from a desire for “something that people can grasp easily—you walk into a class and you see exactly how many kids are there.”³

While class size reduction studies have always produced somewhat ambiguous results, CSR policy has begun to attract more vocal critics from academia and the policy world in recent years.⁴ Despite this, **smaller class size remains a popular concept with many teachers and parents**. According to a survey conducted by the American Federation of Teachers, parents considered class size second in importance only to school safety.⁵ In fact, a 2007 poll indicated that 77 percent of Americans would rather spend educational dollars on class size reduction than on higher teacher salaries.⁶

Eric Hanushek, an economist at the University of Rochester, has published numerous articles in which he finds that few “school inputs”—student-teacher ratios, spending per student, teacher education, teacher experience, and teacher pay—ultimately have an effect on student performance as measured by test scores.⁷ His conclusions are reached after a statistical analysis of data from numerous studies by various researchers, and is well-respected due to the breadth of his coverage. However, it is important to note that Hanushek does not believe that school inputs never produce an effect in the classroom, just that **there is no reason to expect consistent improved student performance by tweaking school inputs**.⁸

This conclusion, of course, has been disputed by other researchers. David Card and Alan Krueger sought to qualify Hanushek’s conclusions, accepting the broad premise

³ Medina, Jennifer. “Class Size in New York City Schools Rises, but the Impact is Debated.” *New York Times*, 21 Feb 09. <http://www.nytimes.com/2009/02/22/education/22class.html>

⁴ Sparks, S. “Class Sizes Show Signs of Growing.” *Education Week*, Dec. 31, 2011. http://www.edweek.org/ew/articles/2010/11/24/13size_ep.h30.html

⁵ Dillon, S. “Tight Budgets Mean Squeeze in Classrooms.” *The New York Times*, Mar. 6, 2011. <http://www.nytimes.com/2011/03/07/education/07classrooms.html?pagewanted=all>

⁶ Chingos, M. April 2011. “The False Promise of Class-Size Reduction.” Center for American Progress, p. 1. http://www.americanprogress.org/issues/2011/04/pdf/class_size.pdf

⁷ Ibid.

⁸ Ibid.

(“class size reduction does not independently work to increase student achievement across the board”) but refuting its application to all cases. Card and Krueger maintain that there are significant advantages to be realized by maintaining small (<15) classes in the early grades, and that class size reduction would have definite positive impact should it be targeted towards those populations shown to benefit from it, particularly schools in high-poverty districts.⁹

It is important to note 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) is not shown to detrimentally affect students in and of itself.** In fact, it is argued that it is not until class sizes reach the 30s that students suffer the effects of a large class, just as reduction in size does not necessarily bring positive outcomes unless it takes sizes down to below 15:

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 below are there appreciable benefits.¹⁰

Despite mixed evidence, school districts across the nation have sought to reduce class sizes in an effort to improve student achievement, an initiative fully supported by the federal government. By 2000, federal funding for class size reduction initiatives had reached \$1.3 billion.¹¹ Under the Bush administration, federal class size reduction initiatives were embedded into Title II of the No Child Left Behind Act, and “by embedding CSR into this provision, NCLB establishes that aiming at teacher quality supersedes the intent to reduce class size.”¹² **Federal policy has begun to deemphasize class size reduction as an across-the-board policy.**

Research appears to agree that in order to see the benefit of reduced class sizes, classes must hold 15 or fewer students. Slight reductions in class size do not yield a measurable benefit for students.

⁹ Card, David and Alan Krueger. “School Resources and Student Outcomes: An Overview of the Literature and New Evidence from North and South Carolina.” Working Paper #366, Industrial Relations Section, Princeton University. July 1996. <http://irs.princeton.edu/pubs/pdfs/366.pdf>

¹⁰ “The School Class Size Debate.” *op. cit.*

¹¹ Milesi, Carolina and Adam Gamoran. “Effects of Class Size and Instruction on Kindergarten Achievement.” *Educational Evaluation and Policy Analysis*, Winter 2006, 28.4. p 287-313.

¹² *Ibid.*

A Review of the Literature

The most influential and credible study of class size reduction initiatives is the Student Teacher Achievement Ratio (STAR), conducted in the late 1980s. Project STAR is frequently cited as a landmark study in CSR research and as such is credited with much of the national widespread push in class size reduction that followed its popularization. The longitudinal study followed two groups of students consisting of small classes sized 13 to 17 students and large classes sized 22 to 26 students. Project STAR is unique for being both large-scale and randomized—two characteristics which are considered the gold standard in social science research. **Students in the smaller classes saw larger test scores gains in reading and mathematics compared to the larger classes.** This effect was most noticeable for minorities and low-income students.¹³ The impact of smaller classes demonstrated by STAR has been cited as some of the largest: student gains in achievement remained the equivalent of three additional months of schooling by four years out after a reduction in class size of 7 to 10 students.¹⁴ It is important to note that in order to see the benefit, **class sizes must fall to at or below 15 students**, when compared with an average class size of 24 students. Most research agrees that **slight class size reductions bear no measurable benefit for students.**

Other initiatives have followed Project STAR, such as the SAGE (Student Achievement Guarantee in Education) program which began in Wisconsin in 1996, limiting K-3 class sizes to 15 students, and originally targeted high-poverty schools and districts, though it now allows any school to participate.¹⁵ Also in 1996, California implemented an ambitious, statewide program of class size reduction that sought to bring down K-3 class sizes to no more than 20 students.

Unfortunately, most studies of the impact on class size reduction on student

The methodologies of the great majority of studies attempting to link class size with student achievement have been challenged. Most do not control adequately for variables, or lack baseline comparison data.

achievement have since been challenged on the basis of a flawed methodology. In the case of the California class size reduction program, researchers question the data constraints (choice of measurement of achievement and lack of baseline standardized test data) within the study as well as a lack of “evidence on the effect of CSR as compared to equivalent additional

¹³ Chingos, Matthew. “The False Promise of Class-Size Reduction.” April 2011. Op. cit., p. 5.

¹⁴ Whitehurst, Grover and Matthew Chingos. “Class Size: What Research Says and What it Means for Policy.” Brown Center on Education Policy. 11 May 2011.
http://www.brookings.edu/~media/Files/rc/papers/2011/0511_class_size_whitehurst_chingos/0511_class_size_whitehurst_chingos.pdf

¹⁵ “SAGE Frequently Asked Questions,” Wisconsin Department of Public Instruction.
<http://dpi.wi.gov/sage/faq.html>

resources.” Accordingly, Chingos argues that **these shortcomings limit the validity of the claims of the research.**¹⁶

The California study had found that the effect of a small class size could overcome the negative impact an inexperienced teacher had on classroom learning. While the research indicates that student achievement in the early grades increased for all demographics, a corresponding finding was that the policy simultaneously **led to a decrease in teacher quality** in the initial years of official implementation.¹⁷ The decrease in class size required statewide hiring of some 25,000 new teachers during the first years of operation. Many of these teachers did not have traditional certification or were inexperienced in the profession. The study revealed that “a first-year teacher as opposed to a teacher with at least two years of experience reduced achievement by an average of 0.10 and 0.07 standard deviations in mathematics and reading, respectively, almost identical to the benefit of the smaller classes.”¹⁸ However, this effect was largely limited to the initial years of the implementation of the program. The doubt that has been cast on the results of this study is unfortunate, as the California project was one of few large-scale projects to find clear positive correlations between class size and student achievement, aside from STAR.

However, not all outcomes of the California study clearly demonstrated a positive correlation between achievement and class size. Students in five of the six participating districts fared better on standardized tests upon experiencing smaller classes for one to three years. However, the sixth district saw its students decline in achievement on standardized tests over the same period.¹⁹ **This disparity indicates that other factors are at play** in influencing students’ performance on tests (e.g., income level).

Another challenge to establishing a link between class size and academic achievement is the over-reliance on standardized test scores, when student achievement is multi-faceted and difficult to generalize.

The American Federation of Teachers supports class size reduction initiatives, stating that the primary benefit of smaller class sizes is the increased opportunity for teacher-student interaction. This allows teachers to recognize the needs of individual students and customize instruction and assignments, get to know students better, and keep students on task.²⁰ Certainly, such occurrences are facilitated in classrooms with

¹⁶ Chingos, M. August 2010. “The Impact of a Universal Class-Size Reduction Policy: Evidence from Florida’s Statewide Mandate.” Program on Education Policy and Governance Working Papers Series, John F. Kennedy School of Government, Harvard University, p. 3.
http://www.hks.harvard.edu/pepg/PDF/Papers/PEPG10-03_Chingos.pdf

¹⁷ Jespen, C. and Rivkin, S. Winter 2009. “Class Reduction and Student Achievement: The Potential Tradeoff between Teacher Quality and Class Size.” *The Journal of Human Resources*, 44:1, pp. 223-250.

¹⁸ Ibid.

¹⁹ “Not All School Districts Benefit from Class Size Reduction.” Op. cit.

²⁰ “Benefits of Small Class Size.” American Federation of Teachers. <http://www.aft.org/topics/classsize/>

fewer students. However, **a definitive causative effect has not been adequately demonstrated** between such perceived benefits to the classroom and improved student outcomes.

Part of the challenge in determining the effect of class size on student achievement is the **lack of measurable indicators** relevant to the case. Student performance is routinely measured by standardized test scores, teacher feedback, future school completion, or job achievement. However, it would be erroneous to state that a child receiving a top-ranking score on the SAT in his Junior year performed well because in third grade he was placed in a class with only 13 peers. In fact, it is a widely (though not universally) held belief that “larger classes have little effect on overall achievement when traditional achievement tests are used as measuring tools.”²¹ Card and Krueger hold that “test scores are inappropriate as an outcome measure, as their explanatory power is very limited, and test scores do not adequately reflect the value of school outputs.”²²

There does appear to be some limited correlation between class size and standardized test performance. According to data from the National Center for Education Statistics, **states with lower student-teacher ratios have higher SAT scores in math, critical reading, and writing**. States with higher student-teacher ratios on the other hand, are about on par with the national average in SAT scores. As analysts of these statistics note, “Maine, for example, has the second lowest ratio in the country, but also averages some of the lowest scores. On the other hand, Utah has the highest ratio, but scores well above the national average on all SAT sections.”²³ Low student-teacher ratios do not necessarily lead to better scores, nor do high ratios mean low scores. These results indicate that student-to-teacher ratios cannot be the only factor contributing to student achievement but nevertheless has some noticeable correlation with student success.²⁴

The following figure graphically represents national statistics of math, critical reading, and writing SAT scores correlating student and teacher ratios. The green lines from the lower left to the upper right represent states with lower student-to-teacher ratios and higher standardized test scores.

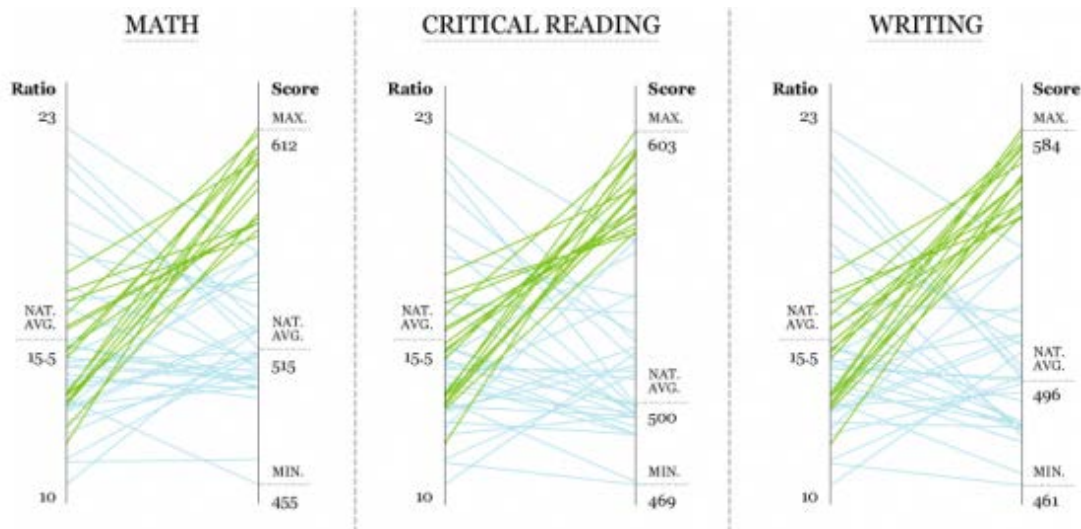
²¹ "Teaching Large Classes." Australian University Teaching Committee. <http://www.ppic.org/main/pressrelease.asp?i=277>

²² Card, David and Alan Krueger. "School Resources and Student Outcomes: An Overview of the Literature and New Evidence from North and South Carolina." Working Paper #366, Industrial Relations Section, Princeton University. July 1996. <http://irs.princeton.edu/pubs/pdfs/366.pdf>

²³ Levitt, Stephen D. et al. September 2011. "The Impact on Short-Term Incentives on Student Performance." University of Chicago. <http://flowingdata.com/2009/11/10/do-we-need-more-teachers/sat-scores/>

²⁴ Most studies focus on class-size as a measure for correlation with student achievement. However, in some cases, pupil-to-teacher ratio (PTR) is still used. For example, the Wisconsin SAGE (Student Achievement Guarantee in Education) program uses PTR as one method to achieve acceptable class size.

Figure 1: State Student-to-Teacher Ratios and SAT Scores



Source: National Center for Education Statistics

Despite the findings from such large-scale research initiatives, there are still others which hold that it is not the case that class size correlates with student achievement. One study considered the outcomes of a statewide class size reduction effort in Minnesota's elementary schools. The Minnesota Department of Education has collected data on student enrollment, performance, and basic demographic characteristics such as race, gender, and English proficiency since the 1988-1989 school year. A study undertaken by researchers at the University of Minnesota found that there was very **little difference in standardized test scores between students in small or large classes** (as defined by falling below or above the state median class size), in either 3rd or 5th grade.²⁵ The researchers admit that such a simple comparison is insufficient, as other variables exist between schools which impact student achievement. However, upon performing a multiple regression analysis, it was still found that differences in student achievement were statistically insignificant.²⁶ No statistically significant effects were noted, either, when examining achievement for particular groups of students such as minorities or those of low income families.²⁷ A summary of the study's findings can be found in Figure 2 below.²⁸

²⁵ Cho, Hyunkuk, Paul Glewwe, and Melissa Whitler. "Do Reductions in Class Size Raise Students' Test Scores?" University of Minnesota. June 2010. p. 18.

<http://faculty.apec.umn.edu/pglewwe/documents/MNclasz3.pdf>

²⁶ Ibid. p. 20.

²⁷ Ibid. p. 22.

²⁸ Ibid. p. 37.

Figure 2: Class Size and Student Performance on Standardized Tests

Grade	Subject	Average Test Score by Class Size Grouping		
		Bottom Third	Middle Third	Top Third
Grade 3	Math	1509.2	1517.5	1507.7
	Reading	1497.0	1508.6	1495.9
Grade 5	Math	1504.3	1510.1	1523.6
	Reading	1541.0	1548.0	1559.2
	Writing	1556.2	1518.3	1548.0

The cutoff class sizes are 21.0 and 24.5 students for 3rd grade, and 22.8 and 26.5 for 5th grade. Class sizes less than 10 or larger than 40 were excluded.

The authors' main conclusion was that **a reduction in class size of 10 students can "increase students' test scores by .04 to .05 standard deviations"** which is considered statistically rather minimal. The unexpectedly small positive benefits, especially given the particularly large reduction in class size usually considered at or above the "threshold" for effectiveness may be due to a disproportionate number of higher income students in Minnesota (lower income students tend to benefit more from smaller class sizes).²⁹

Similar results were found in a study of Florida's statewide class size reduction mandate, in that **no appreciable differences in student achievement were identified** as a result of the policy. Florida has the strictest and most far reaching class size caps of any states and costs have reached \$3 billion a year (spent on teacher salaries and classrooms) to implement.³⁰ State legislation caps class sizes for pre-kindergarten through third grade at 18, for fourth through eighth grade at 22, and for ninth through twelfth grade at 25.³¹ Critics of the legislation argue that it is not the most cost-effective method for reform because it potentially comes at the expense of a stronger curriculum or high-quality teachers.³²

"Critics of the legislation argue that [CSR] is not the most cost-effective method for reform because it potentially comes at the expense of a stronger curriculum or high-quality teachers."

A study titled "The Impact of a Universal Class-Size Reduction Policy: Evidence from Florida's Statewide Mandate" examined Florida's statewide class-size reduction mandate in order to determine the impact on student achievement among students in grades 4 through 8. However, the introduction of CSR in Florida also coincided with several other statewide programs aimed at increasing student achievement, such as

²⁹ Ibid.

³⁰ McNeil, M. "Leaner Class Sizes Add Fiscal Stress to Florida Districts." *Education Week*, Feb, 19, 2008. http://www.edweek.org/ew/articles/2008/02/20/24florida_ep.h27.html

³¹ "Class Size Reduction Amendment." Florida Department of Education. <http://www.fldoe.org/classsize/>

³² McNeil, M. "Leaner Class Sizes Add Fiscal Stress to Florida Districts." Op. cit.

several new choice programs and “Just Read, Florida!” making it difficult to isolate the effects of CSR from other factors.³³

The study compares two groups of students: “untreated” groups that were attending districts already within the designated class size mandate and “treated” groups that were in districts required to reduce class size once the legislation was in effect.³⁴ The district level and school level analysis concluded that **class size had statistically insignificant effects on students’ cognitive and non-cognitive outcomes** (student absenteeism, suspensions, and incidents of crime and violence) in grades 4 through 8. However, the author concedes that, not having examined students in other grades, effects could be larger in earlier elementary grades or secondary grades.³⁵

A review published by the Education and the Public Interest Center and Education Policy Research Unit at the University of Colorado would seem to discredit much of the research put forth by “The Impact of a Universal Class-Size Reduction Policy: Evidence from Florida’s Statewide Mandate.” Primarily, the author argues that the following four flaws with research methodology invalidate the findings:³⁶

- ❖ The grades selected for analysis in this study (grades 4 through 8) have previously been shown to be among the least likely to benefit from CSR.
- ❖ The differences in class size between the treated and untreated comparison groups ranged from .5 to 3.0 students whereas research has shown that the threshold must be larger in order to see a difference in student achievement
- ❖ The statistical modeling in the paper relies on district and school class size averages rather than actual class size of the enrolled students for the calculations
- ❖ Because the comparison groups both had small class sizes, the difference between the groups was the way in which state funding was applied. The author concludes that “this study actually found that administrative discretion in spending state class-size reduction funds did not affect students’ academic performance.”

As is evident from these large studies, the impact of class size on student achievement has yet to be adequately and reliably explored. Those studies which do take a sound methodological approach find little evidence of measurable benefits, while other studies routinely fall prey to poor analysis or insufficient data collection.

³³ Chingos, M. August 2010. Op. cit.

³⁴ Ibid., p. 6.

³⁵ Ibid.

³⁶ Finn, J. 2010. Review of “The Impact of a Universal Class-Size Reduction Policy: Evidence from Florida’s Statewide Mandate.” Education and the Public Interest Center & Education Policy Research Unit, University of Colorado at Boulder. <http://nepc.colorado.edu/files/TTR-FlaClassSize-Finn.pdf>

Although much of the research provides mixed results, certain common themes emerge. Based on analysis of 19 high-quality studies identified by the Center for Public Education, the following general principles in class size reduction were identified:³⁷

- ❖ Smaller classes in K-3 can increase student achievement
- ❖ A class size threshold of 18 students has the best results on achievement
- ❖ Smaller classes should last for the duration of K-3 for the greatest benefits
- ❖ Minority and low-income students in elementary grades benefit the most from smaller classes
- ❖ Teacher experience and preparation is an essential factor in the success of CSR programs
- ❖ CSR requires adequate classroom space and qualified teachers to have positive effects
- ❖ The effect of CSR on academic achievement can be supplemented with professional development for teachers and rigorous curriculum

³⁷ “Class Size and Student Achievement” 2005. The Center for Public Education.
<http://www.centerforpubliceducation.org/Main-Menu/Organizing-a-school/Class-size-and-student-achievement-At-a-glance/Class-size-and-student-achievement-Research-review.html>

Cost-Effectiveness of Class Size Reduction

Recent economic constraints are leading to class size increases nationally. In the first years of the recent economic recession, school districts were largely able to cut expenditures by taking on simple cost-savings measures such as deferring construction projects, eliminating nonessential travel, and examining facilities costs. However, as budgets have remained tight across more years, districts have had to take more drastic measures, many of which impact student learning outright. Laying off teachers is one primary tactic pursued, which in turn increases class size. In fact, according to a survey run by the American Association of School Administrators, **62 percent of districts reported that they were increasing class size in the 2010-2011 school year.** This is a drastic increase from the 26 percent of districts undertaking class size increases in the year prior, and even more from the 9 percent reporting the same in 2008-2009.³⁸ Additionally,

- ❖ 90 percent of districts expected to cut positions in academic year 2010-2011.
- ❖ 61 percent of districts expect to lay off teachers in core subject areas.
- ❖ 33 percent of districts are considering laying off arts, music, or physical education teachers.

Critics are beginning to argue that **class size reduction programs are too costly** and academic improvements are not substantial enough to justify continued class size reductions.³⁹ At a certain point, the question must turn from “does this policy have a positive effect,” to “is this policy the most productive use of educational funds.” Recent researchers have implored policymakers to consider not only the impact of class size on student achievement, but is potential impact relative to other interventions which may go unfunded, such as teaching incentives, in favor of smaller classes.⁴⁰ The Center for Public Education advises school boards to consider several questions before pursuing changes in class size or staffing levels which might precipitate class size adjustments:⁴¹

- ❖ What will the impact of larger classes be on students?
- ❖ Is the impact the same in all grades?
- ❖ Is the impact the same on all types of students?
- ❖ How many students should be in a classroom?
- ❖ Does the state have laws about class size?

³⁸ “Cutting to the Bone: How the Economic Crisis Affects Schools.” The Center for Public Education. October 2010. <http://www.centerforpubliceducation.org/Main-Menu/Public-education/Cutting-to-the-bone-At-a-glance/Cutting-to-the-bone-How-the-economic-crisis-affects-schools.html>

³⁹ Sparks, S. Op. cit.

⁴⁰ Whitehurst, Grover. Op. cit.

⁴¹ “Cutting to the Bone.” Op. cit.

A recent publication from the Brown Center on Education Policy at Brookings revisits the question of class size through the dual lens of state legislative authority and an increasingly austere economic environment. The publication suggests that **raising class size on average by one or two students can be achieved with little damage to academic achievement** but at great cost-effectiveness for a district.

According to the article's researchers, no national or local research in the United States directly compares CSR to specific alternative investments, but instead always returns to the daily operating baseline as the point of comparison. There has been no official study, then, into the differing impacts of a substantial investment in, say, class size versus one made in teacher salaries. Estimates of the effects and costs of education investments are only extrapolated and compared to one another across various studies never intended to be used in such a way.

Teacher compensation is the biggest expense item in any district's budget, for good reason. Numerous studies have shown that increases in teacher quality, presumably preceded by financial incentives and investments, produce significant effects on student achievement. The tradeoff between class size and teacher salaries should be carefully considered when contemplating how district budgets should be allocated.

Maintaining smaller class sizes can mean a larger pool of teachers with lower salaries, or several hard-to-fill positions remaining empty, since funds may become unavailable to attract top talent.

According to one estimate, an increase in class size by 5 students would result in a 34 percent increase in teacher salaries across the board, if the entirety of the cost savings were dedicated to the cause. An estimate from the Brown Center on Education Policy finds a similar result—that for every one-student increase in the student-teacher ratio in the United States, \$12 billion per year would be freed up in salary costs alone, as well as result in a 7 percent decrease in staffing levels.⁴²

There are no large-scale studies which compare class size reduction with other interventions. There is no certainty, then, that CSR has more of an impact on student learning than, say, teacher salary increases.

In other words, while some research suggests that some CSR initiatives may have a positive impact on student achievement at some grade levels in some circumstances for some students, it suggests that **there may be more attractive cost-effective alternatives** for administrators to consider for district implementation. These options may include:⁴³

❖ Raising teacher salaries

⁴² Ibid. p. 12.

⁴³ Ibid.

- ❖ Implementing better curriculum
- ❖ Strengthening early childhood programs
- ❖ Providing more frequent assessment results to teachers to help guide instruction
- ❖ Investments in educational technology

A 2011 review published by the National Education Policy Center (NEPC) offers a strong rebuttal of many of the assertions put forth in “Class Size: What Research Says and What it Means for State Policy.” First, its assertion that CSR is the least cost-effective option is based on faulty accounting and based on “an uncritical, unexamined list of alternative policies.”⁴⁴ Additionally, the report neglects to mention the long-term benefits (lower adult criminal behavior, higher graduation rates, better health status) associated with smaller class sizes and only discusses short term gains on test scores.⁴⁵

One report goes so far as to itemize the **areas of potential cost savings given a reduction in class size**. C. M. Achilles and SERVE recommends “an orderly class size reduction start,” followed by a grade-by-grade treatment involving gradual class size reductions, so that careful planning may take place.⁴⁶ With a gradual introduction and a district-wide policy, the following savings might be realized:

Figure 3: Checkpoints in Assessing True Costs of Appropriately Sized Classes in Primary Grades

Topic	Potential Cost Saving
Grade retention	<ul style="list-style-type: none"> ❖ Number of students held back decreases ❖ Later drop-out rate decreases, graduation increases
Improved student behavior in school	<ul style="list-style-type: none"> ❖ Vandalism costs decrease ❖ Required corrective actions, such as Saturday school or detention, decrease ❖ Classroom disruptions decrease
Remediation and special projects	<ul style="list-style-type: none"> ❖ Fewer expensive special projects required ❖ Concentrate on fewer students for shorter duration
Early identification and correction of learning problems	<ul style="list-style-type: none"> ❖ Special education programs reduced in later years ❖ Programs accurately “targeted” to most needy students ❖ More effective use of inclusion ❖ Note possibility of increased costs in K and 1
Teacher morale	<ul style="list-style-type: none"> ❖ Increased attendance; reduced substitute costs ❖ Reduced “burn out” ❖ Incentive value of small classes

⁴⁴ Schanzenbach, D. June 2011. “Review of Class Size: What Research Says and What it Means for State Policy.” National Education Policy Center. [http://nepc.colorado.edu/files/TTR-CSR-Brookings\[1\].pdf](http://nepc.colorado.edu/files/TTR-CSR-Brookings[1].pdf)

⁴⁵ Ibid., p. 5.

⁴⁶ Achilles, C. M. “Financing Class Size Reduction.” SERVE. 2005. <http://www.serve.org/FileLibraryDetails.aspx?id=79>

Topic	Potential Cost Saving
Creative space use	<ul style="list-style-type: none"> ❖ Transportation-related costs ❖ Flexibility and “found” space ❖ Partnerships with businesses ❖ Remodel, reopen sites ❖ Portable units as last option
Community, parent involvement, volunteers	<ul style="list-style-type: none"> ❖ Small classes attract parents and volunteers ❖ Field trips (etc.) are less congested ❖ Teachers get to know parents well
Teacher assistants	<ul style="list-style-type: none"> ❖ Research suggests reducing the number of assistants and assigning those remaining to non-class work ❖ Remove “general” assistants through attrition

In order to fund class size reduction initiatives, Achilles suggests using Title I, Title II, and Title IV funds, designating lottery funds for class size reduction, or acquiring funding from successful grant applications.⁴⁷

It is not agreed-upon, then, whether class size reduction is a cost-effective intervention, or whether it is more or less effective than other interventions. Still, states and the federal government set money aside to fund CSR initiatives, and small class sizes can result in some long-term cost savings, which ultimately can help alleviate budgetary shortfalls.

⁴⁷ Ibid. p. 9.

Case Studies

In this section we review four school districts: Broward County Public Schools in Florida, Los Alamitos Unified School District in California, Philadelphia Public Schools, and Baltimore Public Schools. In the first two, we examine the CSR initiatives underway and the issue of funding. The following profiles look at gains in student achievement that have been made since implementing overarching school improvement measures, which have included class size reduction in both cases.

Broward County Public Schools

Florida's state-wide class size reduction policy has put a strain on many of its districts. Broward County Public Schools is one such district, fully acknowledging that it cannot meet the Florida DOE's requirements due to its current budget deficit. During fiscal years 2003-2004 through 2005-2006, Broward County Public Schools was able to meet class size reduction targets, but by October 2006, a total of 43 traditional and charter schools were no longer meeting requirements.⁴⁸ In response, the state transferred \$954,157 to the district's fixed capital outlay account for class size reduction in order to address budget shortfalls caused by unanticipated student growth. By February of 2007, all schools receiving the targeted funds had been brought up to compliance. However, recent documents from the district expect the district's schools to once again be found noncompliant in 2011-2012.

Districts are required to show that "every effort was made to meet the constitutional mandate," or else face a penalty for not meeting CSR requirements.⁴⁹ The CSR penalty is calculated based on the number of full time equivalent students in each period that is over the limit. Current Florida mandated class sizes are the following:

- ❖ 18 students in grades pre-K through 3;
- ❖ 22 students in grades 4 through 8; and
- ❖ 25 students in grades 9 through 12.

Class size is not determined by teacher, but rather is **based on room and period**. All students in all courses for a particular room and period are counted together as one class. The grade category (as defined by the limits above) represented by the most students in a room and period is the grade that room's size will be limited to.

One work-around available to districts having trouble meeting class size reduction mandates is to **utilize co-teaching**. Co-teaching is a scheduling method in which two

⁴⁸ "Class Size Reduction Status Update." The School Board of Broward County, Florida. April 2007.
<http://www.broward.k12.fl.us/schoolboundaries/Discussions/DiscussionMay1/CSRUpdateMemo.pdf>

⁴⁹ "Class Size Reduction." Broward County Public Schools. p. 3.
<http://www.broward.k12.fl.us/classsize/pdf/Public-Q&A-081511.pdf>

or more teachers share responsibility for all instruction-related tasks in a class. Co-teaching may be used in the following scenarios, according to the state:

- ❖ Pairing teachers for staff development;
- ❖ Pairing new teachers with veteran teachers;
- ❖ Reducing turnover among new teachers;
- ❖ Pairing teachers out-of-field with teachers who are in-field;
- ❖ Providing more flexibility and innovation in the classroom; and
- ❖ Improving learning opportunities for students.⁵⁰

In order to qualify as co-teaching, the scenario must occur for the entire class period, for the full academic year. In eligible classrooms, the number of students in the room and period will be divided by the number of students, effectively cutting the student-teacher ratio in half.

Schools are also encouraged to “**nest**” courses as a way to work around class size reduction policies. In this strategy, **classes with similar topics and objectives are taught in the same room.** This effectively “hides” the student headcount for the smaller class from official reporting policies. For instance, 7th grade Algebra and 8th grade Algebra may be taught in one room with the same teacher. The enrollment report will reflect the number of students in the class with the higher enrollment, but not the others.⁵¹

College credit-bearing classes are not counted toward CSR headcounts.

In the Broward County school district, a Class Size Reduction Action Committee has been established, consisting of principals and district administrative staff. The Committee has undertaken a study of district resources in terms of budget, staffing, facilities, boundaries, and ETS system modifications necessary for upcoming class size reduction requirements. Additionally, the Committee has been tasked with developing a new method of forecasting teacher needs that takes into account space utilization considerations. The Committee is to make recommendations for staffing needs within a five-year window.⁵²

Los Alamitos Unified School District

Los Alamitos Unified School District (LAUSD) has faced considerable budget cuts over the last three to four years. Since 2008, the state has cut \$18.5 million from LAUSD’s operating budget, equating to a \$1,274 per student decrease. It is likely that these cuts will continue, according to the district. In response, LAUSD has “taken a

⁵⁰ Ibid. p. 6.

⁵¹ Ibid. p. 7-8.

⁵² “Class Size Reduction Status Update.” Op. cit. p. 2.

proactive approach” to fill budget needs. This has included unpaid furlough days taken by staff, teachers, and management and other salary concessions. **Despite the need for financial austerity, the district continues to push through on what they deem to be an integral issue to education in the district: class size reduction.**⁵³

In order to support reduced class sizes, the district runs an annual fund drive to solicit donations from parents. In 2010, donations reached \$125,000. \$75,000 of the funds was distributed to elementary schools, which received between \$6,750 and \$17,250 based on need. Fourth and fifth grade classes ranged from 30-38 students, so effort was focused into hiring teachers to work with small groups of students during math and language arts.

The remainder of the donation (approximately \$50,000) was distributed across the two district middle schools and one high school. The high school utilized funds to create additional math classes, while the middle schools created English and science classes. Each school is allocated money to use on class size reduction initiatives at their own discretion.

The goal for the 2011-2012 fund drive for class size reduction aims to raise \$351 per student in order to keep K-3 class sizes at 24 students per teacher and to lower 4-12 class sizes to a maximum of 35 students.

The School District of Philadelphia

The district comprises the urban Philadelphia area and serves more than 172,000 students.⁵⁴ For the 2011-2012 school year, the district had an operating budget of \$2.8 billion and an annual graduation rate of 45.8 percent.⁵⁵ In 2007-2008, Pennsylvania had an average class size of 22 and 21 for elementary and secondary schools, respectively.⁵⁶

Since December 2001, SDP has undertaken a **massive reform effort** which has resulted in significant gains in student achievement. Investments have been made in curriculum development and materials, professional development, technology, and

⁵³ “The 2011/2012 Annual Class Size Reduction Campaign.” LAUSD.

http://www.losaledfoundation.com/CSR/Class_Size_Reduction_Letter.pdf

⁵⁴ School District Graduation Report, EPE Research Center:

<http://www.edweek.org/apps/gmap/details.html?year=2011&zoom=6&type=2&id=4218990>

⁵⁵ 2011-2012 Budget, School District of Philadelphia:

<http://webgui.phila.k12.pa.us/uploads/kU/rw/kUrw0OaYFoO-X99rFsRAyw/11-05-31-SDP-FY12-Bgt-Adoption-PPT.pdf>

⁵⁶ Table 8, Schools and Staffing Survey, NCES:

http://nces.ed.gov/surveys/sass/tables/sass0708_2009324_t1s_08.asp

alternative education plans. Six years into the reform effort, the following gains in student performance were noted:⁵⁷

Figure 4: Outcomes of Extensive Reform Efforts in the School District of Philadelphia

In 2002	By 2007
23.9% of students were advanced or proficient in reading and 19.6% in math.	40.6% of students are advanced/proficient in reading, and 44.9% in math.
27% of students were at or above the national average in math, 33% in reading, and 28% in language arts.	40% of students are at or above the national average in math, 39% in reading, and 40% in language arts.
26 schools (22 traditional, 4 charters) met federal standards for Adequate Yearly Progress.	142 schools (107 traditional, 35 charters) met federal standards for Adequate Yearly Progress.
There were 38 high schools, with an average student population of about 1,700.	There are now 62 high schools, and 20 charter high schools, with an average student population of 800; half have fewer than 500.
Only 18 high schools offered AP classes.	48 high schools offer AP courses.

Funding priorities targeted to achieve the above results include class size reduction, amongst other approaches such as increased instructional time, staff and teacher training, teacher and principal recruitment, and performance contracts for administrators.

In FY 2008-2009, SDP received a lump sum budget of **\$15.4 million in funding for class size reduction** in kindergarten through third grade for those schools facing the most difficulties, and the expansion of arts and music programs. These initiatives form the centerpiece of the district's investment.⁵⁸

Baltimore City Public Schools

Baltimore City Public Schools⁵⁹ includes the urban portions of the Baltimore area and serves more than 81,000 students.⁶⁰ For the 2011-2012 school year, the district has an operating budget of \$1.2 billion and an annual graduation rate of 52.8 percent.⁶¹ In 2007-2008, Maryland had an average class size of 23 students at both the elementary and secondary levels.⁶²

⁵⁷ "Five-Year Financial Plan." School District of Philadelphia. June 2008. p. 59.

http://www.phila.k12.pa.us/offices/cbo/docs/fy09-five_year_financial_plan.pdf

⁵⁸ Ibid. p. 60.

⁵⁹ Baltimore City Public Schools: <http://www.baltimorecityschools.org/site/Default.aspx?PageID=606>

⁶⁰ School District Graduation Report, EPE Research Center:

<http://www.edweek.org/apps/gmap/details.html?year=2011&zoom=10&type=2&id=2400090>

⁶¹ 2011-2012 Budget, Baltimore City Public Schools:

<http://www.baltimorecityschools.org/cms/lib/MD01001351/Centricity/Domain/74/FY2012AdoptedBudgetBook.pdf>

⁶² NCES, op. cit.

Large-scale district improvement initiatives began in 2007. Because of low student achievement, Baltimore City Schools was on the federal “needs to improve” list. In less than a year after a new CEO took the reins of BCPS, a new decentralized funding plan was implemented in the district. The plan, called the Fair Student Funding Plan, aimed to empower principals with authority, engage teachers in decision making, hold schools accountable, ensure transparent and reliable funding amounts, size the district appropriately, and to put resources into the school.⁶³ The Fair Student Funding Plan gave principals control over the majority of money in their budgets—up to 70 percent from just 3 percent of the budget, in fact. Under this reform, principals could make changes to staffing and school schedules to raise student achievement, through interventions such as improving teachers’ working conditions and reducing a teacher’s total student load. **A typical teacher under the reform saw his or her number of students drop from 150-180 to an average of 88.**

In 2010, after several years of improvement in student achievement, BCPS received the Department of Education’s Award for Urban School Board Excellence. Recently, a new teacher contract was ratified that exchanges the traditional time-in-service model of compensation for a four-tiered career ladder model. In this way, opportunities for advancement are tied to achievement and evidence of leadership and learning.⁶⁴

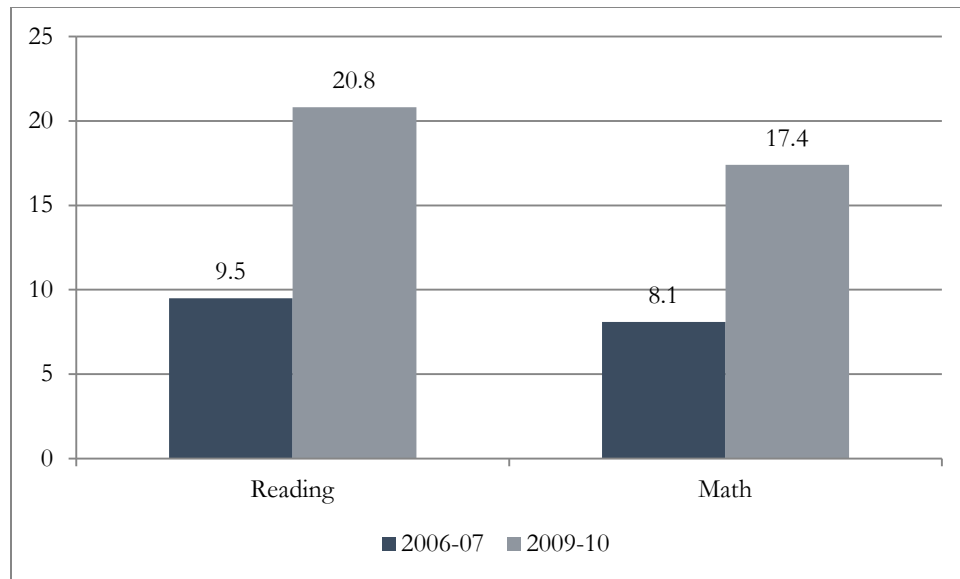
With such huge reformative measures in place, **student academic achievement showed record gains.** Overall, student performance in reading remained at the district’s highest level ever, while math performance continued in its steady climb upward. 72.4 percent of students scored proficient or advanced in reading in 2009-2010, and 66.3 percent scored proficient or advanced in math in the same year.⁶⁵ The figure below summarizes standardized test performance gains from 2007 to 2010.

⁶³ Finne, Liv. “What We Can Learn from Baltimore City Public Schools.” WPC’s Center for Education. October 2010. <http://taxfacs.com/forthekids/index.php/blog/36-blog/52-what-we-can-learn-from-baltimore-city-public-schools>

⁶⁴ “Baltimore City Public Schools.” U.S. Department of Education. <http://www.ed.gov/labor-management-collaboration/conference/baltimore-city-public-schools>

⁶⁵ Rawlings-Blake, Stephanie. “Three Years In, Progress Continues.” City of Baltimore. July 2010. http://www.baltimorecity.gov/OfficeoftheMayor/NewsMedia/tabid/66/ID/511/Three_Years_In_Progress_Continues.aspx

**Figure 5: Maryland School Assessment, Percent Scoring “Advanced,”
Academic Year 2006-2007 versus 2009-2010**



As the chart demonstrates, in three years the district experienced a 119 percent increase in the number of students scoring “advanced” in reading, and a 115 percent increase in the number of students scoring “advanced” in math.

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