

Essential Information for Education Policy

Research Points

Class Size: Counting Students Can Count

For many parents, educators, and policymakers, smaller classes are an apparently foolproof prescription for improving student performance: Fewer students means more individual attention from the teacher, calmer classrooms, and consequently, higher test scores. Is the answer that straightforward?

Most education research has confirmed that small classes do yield benefits. But research also has revealed nuances about how and when small classes will work best, where an investment will result in maximum return, and exactly how many students a “small” class should have. The details of these findings can help policymakers strike a practical balance between making classes smaller and breaking the bank in these budget-conscious times.

The STAR Experiment

The nationwide trend toward smaller classes was prompted by a class-size reduction experiment in Tennessee called the Student/Teacher Achievement Ratio, or STAR (1985–1989).¹ With STAR, the field of

education research gained one of its few large-scale, randomized experiments. Approximately 11,600 students and 1,300 teachers in 76 schools and 42 districts took part in the experiment, making the resulting scientific evidence among the most credible available.

At each grade level, kindergarten to third grade, a controlled study was conducted to test whether small classes of 13 to 17 students had a positive impact on student achievement (relative to regular-sized classes of 22 to 26 students). STAR data indicated that small classes led to statistically significant improvements in reading and mathematics, and benefits were greatest for students who started in small classes early (full-day kindergarten or first grade).

Additional Research

Other research on class-size reduction adds to the STAR findings. One example: Wisconsin's Student Achievement Guarantee in Education (SAGE) project, a statewide effort to increase the academic achievement of children living in poverty.² Using roughly the same K–three class sizes, SAGE reinforced STAR's results in a different location and with a different ethnic composition. SAGE also showed that the impact is greater for low-income students.

While small classes benefit all kinds of students,³ much research has shown that the benefits may be greatest for minority students or students attending inner-city schools. For these students, smaller classes can shrink the achievement gap and lead to reduced grade retention, fewer disciplinary actions, less dropping out, and more students taking college entrance exams.⁴

The most dramatic impact seems to be achieved by reaching students early. Ideally, students should experience small classes of 13 to 17 students when entering school, in either kindergarten or first grade. While there is strong evidence of academic improvement during the first two years spent in a small class, there is more ambiguity about the value of additional years. It is not certain that there are added gains during second- and third-grade small classes.⁵ Yet, recent studies indicate that, after the students have returned to regular-sized classes (in fourth through eighth grade), students who were in small classes for three or four years retain a greater advantage.⁶

Why It Works ... and When It Might Not

Changes in student and teacher behavior are believed to be a major reason why small classes work.⁷ Teachers in small classes pay greater attention to each pupil. Students in these classes experience continuing pressure to participate in learning activities and become better, more involved students. Attention to learning goes up, and disruptive and off-task behavior goes down.

Just placing another adult in the class does not achieve the same results, however. In the STAR experiment, policymakers thought that assigning full-time paraprofessionals to assist teachers might be a

low-cost alternative to reducing class size. But careful analysis of the STAR data has made it clear that an aide in the classroom has no positive impact on student achievement or behavior.⁸

Also, it seems that class sizes must be reduced substantially to achieve the benefits. There is no experimental research suggesting that any benefits are realized by subtracting only a few children from a larger class — for example, transitioning from 28 to 25 students. Even a class of 20 students may be too large.

Paying for Smaller Classes

The costs for reducing class sizes will depend on how much reduction is needed (i.e., how large classes are now) and existing teacher pay scales. The table on page 3 provides estimated costs, but each state and locality will be different. There is no doubt that even if there are long-term savings from less in-grade retention, reduced dropout rates, and higher adult earnings,⁹ the front-end costs can be considerable.

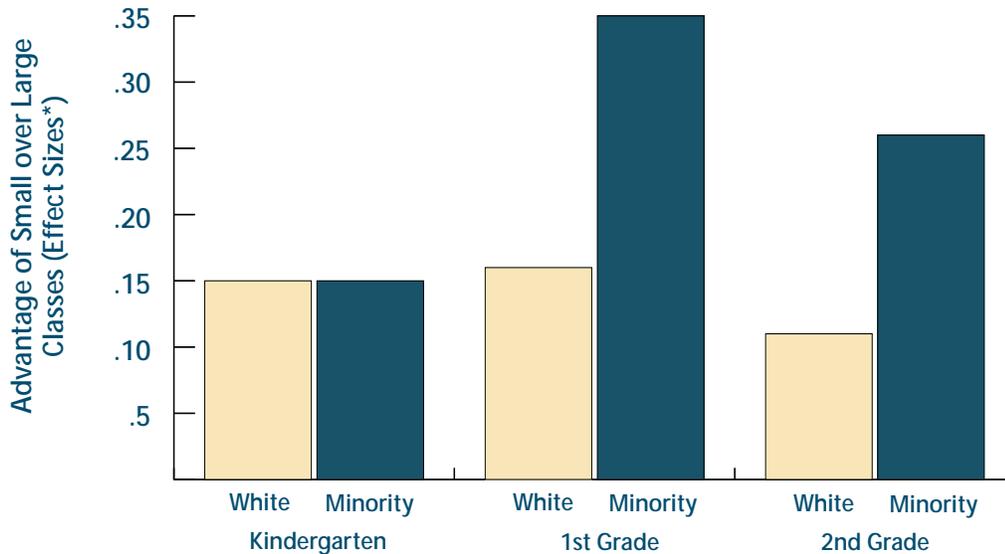
One means of financing class-size reduction is to shift resources that are being spent on ineffective educational interventions.¹⁰ Extra teachers in a school who do not have regular class assignments (e.g., “pullout” remedial, special education, and Title I teachers) are costly and may not have the same positive impact on achievement as shrinking class size. Indeed, a persistent puzzle in class-size research is evidence showing that decreases in the number of pupils per teacher over the past 30 years have had little discernable effect on students' overall test-score gains and, therefore, a weak relationship with academic achievement.¹¹ However, while pupil-teacher ratio (PTR) and small class size are correlated, they are not the same. PTR refers to the number of students and teachers in an educational unit (e.g., a school), while class size refers to the number of students regularly in a single teacher's classroom for whom that teacher is responsible. Consequently, reassigning existing staff to full-time regular classes could lower class size without adding additional cost.

There are also nonfiscal costs to consider. Reducing class size can require new facilities and result in shifts in teacher quality — less competent teachers filling new jobs and better teachers moving

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Class Size: Benefits and Costs

Significant Benefits in Reading from Attending Small Classes



*The effect size of an experiment is the extent to which the independent variable — class size — influences the outcome, in this case, student achievement in reading. The graph shows that in kindergarten there were significant and equivalent effects of small classes for both white and minority students. In the first and second grades, effects were even greater for minorities.

Figure adapted from Finn, J.D. (1998). *Class Size and Students at Risk: What Is Known? What Is Next?* Washington, DC: U.S. Department of Education.

Costs of Class-Size Reduction

With starting salaries averaging around \$31,000 nationwide¹² (fringe benefits not included), this is what it might cost to reduce class size to 17 students in a 1,000-student school, provided that you have enough space for the extra classes.

Noteworthy

Shifting resources away from ineffective educational interventions can minimize the cost of smaller classes. Extra teachers in a school who do not have regular class assignments are costly and may not have the same positive impact on achievement as shrinking class size.

Current class size	Current number of classes	Reduced-size number of classes	Additional teachers needed	Additional direct teacher salary cost
20	50	58	8	\$248,000
25	40	58	18	\$558,000
30	34	58	24	\$744,000
35	29	58	29	\$899,000

Facts at a Glance

- ▶ For minority students, smaller classes can shrink the achievement gap and lead to reduced grade retention, fewer disciplinary actions, less dropping out, and more college-entrance test taking.
- ▶ Small classes have the greatest impact when experienced in the early grades. A kindergarten or first grade class of 13 to 17 students is ideal.

What Should Policymakers Do?

In the stockpile of educational policy initiatives that are worth finding resources for, small classes rank near the top of the list. But small classes are not a quick fix, and negative, unintended consequences are possible. In weighing the pros and cons of a class-size reduction policy, you will want to set the costs of small classes against other possible uses of the same funds. As for class size itself, however, the research tells us that for maximum effect, small classes should meet these conditions:

First, early intervention is important. Start in kindergarten or first grade.

Second, the number of students in a class should range from 13 to 17.

Third, if resources are scarce, target implementation by focusing on at-risk students.

Fourth, maintain intensity by ensuring that students experience small classes every day, all day.

Fifth, small classes should last at least two years for initial benefits and three to four years for longest-lasting benefits after the small classes are over.

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to more attractive positions. In California, a lightning-quick ramp-up of statewide class-size reduction policy created many complications. Many new classrooms had to be found or built, and thousands of new teachers were hired within several months of the 1996 launch. Teaching quality suffered. While test scores have gone up in California since the small-class initiative started, researchers have been unable to determine how much, if any, of the improvement resulted from class-size reductions, as opposed to several other initiatives that were launched at around the same time.¹³

Concluding Point

There is no doubt that small classes can deliver lasting benefits, especially for minority and low-income students. However, they are not a cure-all for low academic achievement, and they may not always be the best use of scarce resources. In weighing the pros and cons of a class-size reduction plan, policymakers will want to measure the costs of class-size reduction against other possible uses of the same funds.

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