

The Class Size Debate: What the Evidence Means for Education Policy

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By Darian Woods



“The days in which lawmakers support schools that are somehow good enough for someone else’s children, but not for their own – those days must be over.” - Arne Duncan, U.S. Education Secretary, January 12, 2015

Why class sizes?

The more students a teacher is responsible for, the harder it is to teach. That’s hard to argue with. Yet the research and policy around this idea is surprisingly controversial. We can say with confidence that smaller class sizes improve grades for younger learners. But the answers to deeper questions are less clear.

The issue of class sizes is a live policy debate. Teachers unions from Oakland, California to Auckland, New Zealand are advocating for smaller class sizes. A call for smaller class sizes was second only to higher salaries for the LA teachers union at recent protests. The president of the National Education Association, Lily Eskelsen García, attributes fighting for smaller class sizes as her motivation for becoming an education activist.

The idea of smaller class sizes is strongly supported by teachers and the general public. A national survey of 50,000 Americans found that reducing class sizes was perceived to be the best way to reform schools. And yet when public budgets are tight, class sizes are quick to grow. California's class size cap increased substantially following the Great Recession.

While there is evidence that smaller class sizes improve student learning, the magnitude of the impact must be weighed against the impact of other reforms. For example, would paying higher salaries to retain a high-quality teacher workforce be money better spent?

The question of which students would benefit is also important: would smaller classes improve high achievers' learning more than, say, students who are still catching up? Or would the gains in learning be spread out broadly among the children in the class?

Jessica Tyson, a history and English teacher at Oakland Technical High School, said that the issue is more than just the right size of an individual classroom. It's also about making room for better lesson preparation.

"Teaching fewer hours and having that extra hour in the day to collaborate, plan, grade and reflect on what students are doing would be very helpful to me," Tyson said.

"U.S. teachers spend more time in front of students by a significant margin than in other developed countries," she said. "I was struck by how wonderful [it] would be ... if I could just teach slightly less, how much more I could do."

The Evidence on Class sizes

To answer the question of how much difference smaller classrooms make for student learning, we need good data and strong analytic methods that can isolate the effect of class sizes. Researchers do not want to accidentally pick up other effects such as differences in school resources, for example, or difference in students' characteristics or parental involvement.

Two of the best studies we have on this issue – Project STAR and a 1999 analysis of Israeli schools by economists Joshua Angrist and Victor Lavy – address these problems. They both show a positive effect from smaller school sizes in the first few years of school. I discuss this research in greater detail below.

Placing children in random class sizes: Lessons from Project STAR

Much of what we know about class sizes comes from an experiment called Project STAR (also known as the Tennessee Study). From 1985 to 1989 11,600 Tennessee students from kindergarten to third grade were randomly assigned to three class-size categories. The three class sizes were 13–17 students, 22–25 students and over 25 students.

The results were strong. An average student assigned to the smallest classes had a reading score nearly 8 percent higher than students in the medium-sized classes. The smaller-class students, on average, achieved 9 percent higher math scores. (See the paper [here](#).)

Students in smaller classes who completed high school were more likely to take college-entrance exams than

students.

Education economists Alan Krueger and Diane Schanzenbach calculate that, based on Project STAR's results, reducing class sizes from 22 to 15 students has a 5.5 percent return in annual benefits. This takes into account students' increased lifetime earnings.

Project STAR generated the best data we have on class sizes, but findings should be interpreted carefully. First, the experiment was conducted in larger urban schools, so results may not be as strong for smaller suburban schools. Second, it is hard to believe that the students were completely randomly assigned; it's easy to imagine some motivated parents lobbied to move their children to the smaller classes. Finally, Tennessee is a much below-average state for education. This means the Project STAR students may have benefited from the class-size reductions more than students in higher-performing states might.

This study also only looks at the effects on students who were in small classes in their first few years of school. Stanford economist Eric A. Hanushek and his colleague, Steven Rivkin, downplay the conclusion that many researchers draw from Project STAR – that smaller classes are a cost-effective policy to improve learning. In a 2006 paper emphasizing teacher quality over class sizes they are skeptical. “In only 40 out of 79 schools,” they write, “did the kindergarten performance in the small classroom exceed that in the regular classroom.” This is better than random (which would be an improvement in about 26 out of the 79 schools). Nevertheless, they argue, the results show too weak an effect to justify wholesale change to class sizes.

Despite Hanushek and Rivkin's reservations, Project STAR indicates room, on average, for improving test scores for children ages 5 to 8 in class sizes larger than 17 students. If real-world results replicate those found in the STAR project, we can expect higher student achievement by moving towards smaller classes.

Maimonides' Rule: What a 12th Century rabbinic scholar can tell us about class sizes

Because the random allocation of students found in Project STAR is so rare, education researchers have found creative ways to mimic a randomized experiment. MIT professor Joshua Angrist and University of Warwick professor Victor Lavy use the unique education policy of modern Israel to study class sizes. The researchers harness Israel's rule that public school classrooms must not have more than 40 students, inspired by 12th Century rabbinic scholar Maimonides who advocated class sizes smaller than 40 students.

After 41 students are enrolled, the class splits into two. This continues after each multiple of 40. Class size is therefore related to the random chance of how close school enrollment is to a multiple of 40 and less related to confounding variables. Socioeconomic characteristics schools are controlled for.

For 5th grade students, Angrist and Lavy find a 10-student increase in class size explains a 6.5 percent drop in the average student's reading comprehension scores and 4.5 percent drop in math scores. Angrist and Lavy do not find statistically significant effects of class size for third graders, possibly due to test-score training that year. The 5th grade effects of class size on achievement are strong, giving further evidence that class sizes matter. The non-effects and weak effects of class size on 4th and 5th graders highlights some uncertainty in the literature and data.

The heart of the academic debate on class sizes

Significant and insignificant results pepper the class size literature. Karen Akerhielm, a graduate of Yale's economics PhD program, finds a 10-student reduction in class sizes explains approximately a 5 percent improvement in science and history test scores. Stanford economist Caroline Hoxby, in a 2000 paper, cannot find a relationship between school districts' test scores and estimated class sizes. She also cannot find any evidence that the effect is stronger for schools with a higher proportion of low-income or African American students. This is in contrast to the strong effects found in the STAR project.

Conflicting results such as these in the literature – and differing opinions on how to weight the findings of each paper in meta-analyses – have meant that two of the most prominent researchers in the field, Hanushek and Krueger, draw different conclusions. In the 2002 book *The Class Size Debate* Hanushek writes, “despite the political popularity of overall class size reduction, the scientific support of such policies is weak to nonexistent.” In the same book Krueger (2002) writes, “the strongest available evidence suggests a connection” and that reducing class sizes from 22 to 15 students per teacher has a positive benefit-cost-ratio at a real discount rate lower than 6%.

While this academic debate over the methods and results of experiments on class size reduction continues, the issue has lost much of its momentum in education policy circles. Much of this goes back to the related debate about what kind of reforms produce the biggest impact for the money spent.

Eric A. Hanushek, for example, argues that focusing on teacher quality over class sizes yields a better return on one's investment. In an influential 2005 paper on factors that influence student achievement, Hanushek compares reducing a class by ten students to switching the teacher with a moderately better replacement.

“The effects of a costly ten-student reduction in class size are smaller,” Hanushek says.

Hanushek is not claiming that smaller classes are ineffective at improving achievement, just that it may not be the right priority. The verdict is still out whether an increase in ‘teacher quality’ is an appropriate comparison in terms of cost and amenability to policy changes. When we talk about improving teacher quality rather than decreasing class sizes, are we talking about higher salaries to attract and retain better teachers? Are we talking about higher credential requirements for new teachers (which has been shown to be ineffective)? Are we talking about more on-the-job training? Teacher quality means different things to different people; this suggests caution should be taken when comparing teacher quality with class sizes.

In short...

Despite strong arguments on both sides of the debate, there are reasons why we should take small class sizes seriously. The methodologically strongest experiment, the STAR experiment, shows strong results. Positive results are commonly found in the literature. Private schools reveal parents' and teachers' preferences for smaller student-teacher ratios. School sizes are large in many U.S. school districts, and the problem may be even worse than the official statistics.

“Most of the class sizes I've had have been around 28 people,” Oakland teacher, James Malamut, said. “When I worked for the School District of Philadelphia it was 31 on paper, but there would be times when it was closer to 35. They'd sneak a few kids in there unofficially.”

When teachers repeatedly raise an issue, policymakers should listen. Teachers close to the actual practice of teaching strongly believe in reducing the student-to-teacher ratio. A 2007 survey found that 81 percent of American teachers would prefer smaller class sizes over higher salaries.

“I think it would have a really significant impact,” Malamut said. “I’d be able to give more individualized attention in the class. I’d have more time for preparation. And when grading I’d be able to give more individualized feedback.”

The evidence on the relationship between class size and achievement is not conclusive but there is good reason to believe that smaller classes could be beneficial to students in the early years of primary school and especially for minorities and low-achieving students. Whether it follows that class-size reductions are poor value-for-money is less certain. Reducing class sizes, particularly for 6- to 14-year-olds where the evidence is strongest, should be considered – alongside teacher training, salaries, accreditation, and collaboration initiatives – as a serious albeit expensive policy option to improve educational outcomes and reduce educational outcome disparities. Does class size matter? It certainly does.

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