

Benefits of Small Class Size

Compelling evidence demonstrates that reducing class size, particularly for younger children, has a positive effect on student achievement overall and an especially significant impact on the education of disadvantaged children. The American Federation of Teachers (AFT) is a strong advocate for reducing class size to help raise student achievement, especially in high-poverty, at-risk schools.

Large gains in both math and reading stem from more effective teaching and more focused learning. More teacher-student interaction allows teachers to recognize the needs of individual students and customize instruction and assignments. Teachers know the students better and can recognize problems and special needs early. For their part, students are more likely to be on task and less likely to talk amongst themselves. They create fewer discipline problems and engage in more pro-social behavior, allowing teachers to devote more time to instruction and less to controlling the class. Smaller classrooms are more pleasant and have fewer distractions. As participants in early class size experiments enter the workforce, researchers have found long-term effects of small classes in the early years. Students with two or more years of small classes in elementary school score higher on tests in middle and high school, are more likely to graduate and are more likely to take the SAT or ACT and apply to college. They are also healthier and eventually earn more, paying more taxes and receiving less welfare.

Consensus on the benefits of small classes has led parents, teachers, administrators, policymakers and politicians to adopt some form of class size reduction in all but six states. Simply cutting class size does not guarantee significant increases in performance for all students, however. The AFT supports class size reduction plans that:

1. Aim for classes between 15 and 19 students each. Schoolwide or districtwide averages mean that some students remain in classes far exceeding the optimal size.
2. Target schools with low-achieving and low-income students. "One size fits all" class size plans neglect staffing problems and overcrowding in low-achieving schools, which gain the most from class size reduction.
3. Have a thoughtful implementation plan so that districts have the time and money to provide adequate classroom space and hire highly qualified teachers.

Supporting Research

Project STAR

Tennessee's Project STAR (Students-Teacher Achievement Ratio) was designed to determine the short- and long-term effects of small class size in grades K-3 on student performance.

Phase 1: 1985-1989. K-3 classes of 13-17 students were compared with classes of 22-26 students.

Findings:

- Smaller class students substantially outperformed larger class students on both standardized and curriculum-based tests. This was true for white and minority students as well as inner city, suburban, and rural schools.
- In smaller classes, fewer students were retained in-grade, and there was earlier identification of struggling students.

Phase 2: Lasting Benefits, 1989. This study began as a follow-up study to the STAR study to examine if the effects of smaller class sizes stayed with students once they returned to larger classes.

Findings:

In fourth grade, students from smaller classes still outperformed students from larger classes in all subjects and were better behaved.

Phase 3: Project Challenge, 1990. Based on these findings, Tennessee began phasing in smaller classes in grades K-3 in the poorest districts.

Findings:

- These districts moved from near the bottom of school district performance in Tennessee to near the middle in reading and mathematics for second grade.
- In-grade retention was reduced.

1999 Update

Researchers reported that the effects of small class sizes in grades K-3 lasted all the way through high school. Students from small classes are:

- More likely to graduate high school on schedule and less likely to drop out;
- More likely to have enrolled in honors classes and to graduate in the top 10 percent of their class; and
- More likely to take SAT or ACT exams, indicating that they plan to go on to college. Furthermore, the black-white achievement gap is reduced by 56 percent for black students who began school in small classes.

Researchers also found that students in small classes in grades K-3 were between 6 and 13 months ahead of their regular-class peers in math, reading, and science in each of grades 4, 6, and 8. Researchers reported that for the benefits to be sustained through later grades, at least three years in a small class are necessary. In addition, the benefits of having been in a small class in the primary years increase from grade to grade.

2010 Update

Researchers from Amherst College attempted to differentiate which kinds of schools and students benefit the most from smaller class sizes.

Findings:

- The researchers found that all students in high-poverty schools benefit from reduced class sizes, with high-achieving students benefiting the most.
- Researchers also found no evidence of changes in teacher behavior or pedagogical practice when class sizes are reduced, indicating that “student differences account for the positive relationship between achievement and the benefit of smaller classes.”

Student Achievement Guarantee in Education (SAGE) Program

SAGE began in Wisconsin in 1996 by phasing in class size reduction in grades K-3 in school districts serving high-poverty students. The aim is to achieve a student/teacher ratio of 15:1.

Findings:

- SAGE first-, second-, and third-grade students performed consistently better than comparison students in mathematics, reading, and language arts on the Comprehensive Test of Basic Skills.
- First- and third-grade, African-American SAGE students gained significantly more than SAGE white students, closing the achievement gap. The achievement gap widened for non-SAGE students.
- Teachers reported more individualization in their instruction due to fewer discipline problems; being more knowledgeable about each student; and having more enthusiasm for teaching.

It should be noted that while SAGE findings are consistent with Project STAR findings, SAGE schools were also required to implement a rigorous academic curriculum, provide before and after school activities, and implement professional development programs and accountability plans.

Rouse Study

The Milwaukee Parental Choice Program is a publicly funded voucher program. In her study, Rouse compares the achievement of Milwaukee voucher students and students in three types of Milwaukee Public Schools: regular schools, magnet schools, and school participating in the Preschool to Grade 5 Grant Program (P-5 schools). P-5 schools serve “predominantly minority and extremely disadvantaged: children and receive supplemental state funds that have enabled them to cut their pupil-teacher ratio, on average, to 17 to 1.

Findings:

- Students in the P-5 (small class size) public schools made “substantially faster gains in reading” than those in the regular public schools, the public magnet schools, and the voucher schools.
- Students in the P-5 (small class size) public schools made faster math gains than students in the regular public schools and the public magnet schools, and the same gains as the voucher schools.

Wenglinsky Study

Educational Testing Services (ETS) researcher Harold Wenglinsky compared 1992 fourth- and eighth-grade NAEP math results to class size and other policy initiatives.

For purposes of the analysis, Wenglinsky defined small class size as fewer than 20 students.

Findings:

- Fourth and eighth graders in small classes performed better than those in large classes, even when taking into account demographics, resources, and cost of living.
- Fourth graders were one-third of a grade level ahead of their peers from large classes; eighth graders were one-eighth of a grade level ahead.
- The largest gains were found for inner-city students: fourth graders were three-fourths of a grade level ahead of students in large classes.

Class-Size Reduction (CSR)

During the mid-1990's, the California legislature passed the Class Size Reduction (CSR) incentive program, which provided funds to schools statewide that set class size to 20 students in grades K-3.

The \$1 billion initiative was signed just six weeks before the start of the new school year. Even though the program was voluntary, there was significant pressure from parents and the press to reduce class size. By the end of the first year, 88% of first graders were in reduced classes along with 57% of second graders.

Due to the program's design, it is unclear how much effect the initiative has had on raising student performance, resulting in some officials questioning the cost-effectiveness of the program. Although researchers are unable to attribute achievement gains directly to CSR, California's efforts to reduce class sizes provide important lessons for education officials trying to implement small classes in their states and/or districts.

CSR researchers point to a variety of reasons for the inconclusive results:

- CSR in California was associated with declines in teacher qualifications and an inequitable distribution of qualified teachers. CSR caused an immediate need for 20,000 new teachers in a very small period of time. To meet the demand, teacher certification requirements were "relaxed", resulting in the number of uncertified teachers rising from 2% to 12% in the second year. In addition, qualified veteran teachers were taking advantage of the new vacancies to leave less advantaged districts for more desirable positions in more affluent districts, meaning that for low-income students, 20% of teachers were uncertified.
- CSR was offered in every school instead of targeting funds to disadvantaged schools. This "one size fits all" approach with funding resulted in wealthier districts that already had smaller classes receiving an initial boon of funding, while overcrowded districts were forced to dip into their general funds to cover shortfalls.
- Funding was inadequate. CSR provided \$650 per student compared to the \$2,000 per student provided for the SAGE program.
- Serious problems associated with overcrowded schools were ignored.
- No trial program was conducted to explore various class size reduction options.
- The adopted definition of small classes (20 students) directly contradicted prior evidence and experiences of other states.

International Research

Maimonides' Rule, Israel

Due to rabbinic scholar Maimonides' interpretation of the Torah regarding education, Israel has capped class size at 40 since 1969. This means that a grade of 80 students will have two classes of 40 each, but a grade of 81 students will have class sizes of 27, 27 and 26. The wide and random difference in class size provides a natural experiment.

Findings:

- Students in smaller classes had higher test scores in math and reading after their second and third years in small classes. Their advantage over students in large classes was greater in the third year than the second, suggesting that learning gains are cumulative over time. Percentile gains were roughly the same as the Tennessee Project STAR experiment.
- Researchers used data from third- to fifth-graders, demonstrating that small classes are beneficial beyond the earliest years.

Institute of Education Class Size Study, University of London

Researchers randomly selected 11,386 students in the United Kingdom and followed them from the age of 4 to 7, recording demographic variables along with class size and test scores. Teachers were surveyed about how they spent classroom time, and researchers systematically observed selected classrooms by noting interactions every 10 seconds.

Findings:

- Students in small classes gained up to 14 percentile points on reading tests compared to their counterparts in large classes, with low-achieving students posting the biggest gains. On math tests, students of all achievement levels consistently scored 10 percentile points higher in small classes. This effect is roughly the same as the effect found in the Tennessee Project STAR experiment.
- Students in larger classes were twice as likely to be off-task and spent more time talking to each other. Their teachers reported spending less time on instruction and providing feedback for individual students.
- Students in small classes had almost 50 percent more one-on-one interaction with their teachers than students in large classes; they also received more immediate and positive feedback.

References and Additional Reading

Benefits of Small Class Size

AFT Resources

- Small Class-size benefits extend beyond school, American Teacher, December/January 2008 www.aft.org/pdfs/americanteacher/at_dec07jan08_classnotes.pdf
- International studies add to body of class-size research, American Teacher, May/June 2008 www.aft.org/pdfs/americanteacher/at_mayjune08.pdf#page=8

Project STAR

AFT Resources

- Statement of AFT President Sandra Feldman on Project STAR Class Size Study, April 29, 1999. www.aft.org/newspubs/press/1999/042999.cfm
- Where We Stand: A STAR Story, June 1999. www.aft.org/pdfs/press/www_0699.pdf
- Where We Stand: Class Size Revisited, July 2, 1995. <http://source.nysut.org/weblink7/DocView.aspx?id=918>

Additional Resources

- McKee, Graham, Sims, Katherine, and Steven Rivkin. "Disruption, Achievement and the Heterogeneous Benefits of Smaller Classes," NBER Working Paper No. 15812, JEL No. I20,I21, March 2010.
- Krueger, Alan B. & Diane M. Whitmore. "Would Smaller Classes Help Close the Black-White Achievement Gap?" In J. Chubb and T. Loveless (Eds.), Bridging the Achievement Gap. Washington, DC: Brookings Institute Press, 2002.
- Krueger, Alan B. and Diane M. Whitmore. "The Effect of Attending a Small Class in the Early Grades on College-test Taking and Middle School Test Results: Evidence from Project STAR," Economic Journal, Vol. 111, pp. 1-28. 2001.

Student Achievement Guarantee in Education (SAGE) Program

- Smith, Phil et al. "Class Size Reduction in Wisconsin: A Fresh Look at the Data," Education Policy Studies Laboratory, Arizona State University. September 2003. www.asu.edu/educ/eps/EPRU/documents/EPSL-0309-110-EPRU.doc
- Molnar, Alex et al. "The 1999-2000 Evaluation Results of the Student Achievement Guarantee in Education (SAGE) Program," December 2000.
- SAGE and Direct Instruction Projects. "1998-99 Results of the Student Achievement Guarantee in Education (SAGE) Program Evaluation," Executive Summary. December 1999.
- Molnar, Alex et al. "Evaluating the SAGE Program: A Pilot Program in Targeted Pupil-Teacher Reduction in Wisconsin," Educational Evaluation and Policy Analysis. Vol. 21 No. 2 pp. 165-177, Summer 1999.
- Zahorik, John A. "Reducing Class Size Leads to Individual Instruction," Educational Leadership. Vol. 57, No. 1, pp. 50-53. September 1999.

Rouse Study

AFT Resources

- Vouchers Vs. Small Class Size, April 1998 www.aft.org/pdfs/teachers/vouchersvsclass0498.pdf

Additional Resources

- Rouse, Cecilia. "Schools and Student Achievement: More Evidence from the Milwaukee Parental Choice Program," December 1997.
- Molnar, Alex. "Smaller Classes, Not Vouchers, Increase Student Achievement," January 1998.

Wenglinsky Study

- Wenglinsky, Harold. "When Money Matters," ETS Policy Information Center, April 1997. www.ets.org/research/pic/wmm.pdf

Class-Size Reduction (CSR)

- Bohrnstedt, George W., and Brian M. Stecher, eds. "What We Have Learned About Class Size Reduction in California," CSR Research Consortium, August 2002.
www.classsize.org/techreport/index-02.htm
- Bohrnstedt, George W., and Brian M. Stecher, eds. "Class Size Reduction in California: Early Evaluation Findings, 1996-1998," CSR Research Consortium, June 1999.
www.classsize.org/summary/98-99/

Maimonides' Rule, Israel

- Angrist, Joshua D. and Victor Lavy. "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement," *The Quarterly Journal of Economics*. Vol. 114 No. 2, pp. 533-575, May 1999.

Institute of Education Class Size Study, University of London

- West, Martin R. and Ludger Woessmann. "Crowd Control: An International Look at the Relationship between Class Size and Student Achievement," *Education Next*. Summer 2003.
- Blatchford, Peter, Bassett, Paul, Goldstein, Harvey, and Clare Martin. "Are Class Size Differences Related to Pupils' Educational Progress and Classroom Processes? Findings from the Institute of Education Class Size Study of Children Aged 5-7 Years," *British Educational Research Journal*, 29 (5), pp. 709-730. 2003.