class size matters
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Is there a threshold effect in reducing class size?

There is a common misconception that a particular threshold must be reached in reducing class size -- that is, a class has to be decreased below a certain number of students to have a positive effect on student achievement.

This argument is often used in order to discourage class size reform efforts, since shrinking classes below a particular figure is viewed as either impractical or too expensive to contemplate. Yet the research shows that that there is no magic number that needs to be reached before a smaller class will result in more learning.

- Economist Alan Krueger of Princeton analyzed the Tennessee STAR data and found that even within the larger classes of 22-25, students did better the smaller their class size -- that is in classes of 22 or more. According to Krueger, Charles Achilles, and other class size researchers, the relationship between lower class size and higher student achievement is roughly linear, with no evidence of a threshold.[1] According to Achilles, the effect is approximately -.35 for every additional student added to a class.[2]

- Other analyses have found that class size benefits are roughly linear, and that each additional student added to a class results in a decrease in the class average for students in all academic scores. In the SAGE studies in Wisconsin, the test score decline in all academic areas was found for each student added to a classroom above 15 in the early grades; in OECD analyses in Europe, a decline in scores in reading, math and science was found for high school classes for each student added above 25. [3]

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[1] Alan B. Krueger, ***"Experimental Estimates of Education Production Functions,***" The Quarterly Journal of Economics, Volume 114, Issue 2, May 1999. This paper is available at http://www.irs.princeton.edu/pubs/pdfs/379.pdf, see esp. pgs. 28-29. See also Jayne Boyd-Zaharias, et.al., "Quality Schools build on a Quality Start" in: *Creating The Quality School*, ed. Edward W. Chance April 1994, pp. 119-120, table 3, http://www.heros-inc.org/quality.pdf.

[2] See chart entitled "***Correlation between Individual class sizes and Stanford Achievement Test*** Scores in Reading and Math by Grade", from STAR secondary analyses.

[3] Molnar, A., Smith, P., Zahorik, J., Halbach, A., Ehrle, K., & Hoffman, L. M. (2001). ***2000-2001 evaluation results of the Student Achievement Guarantee in Education (SAGE) program.*** Milwaukee, WI: Center for Education Research, Analysis and Innovation, University of Wisconsin. pp. 141 - 142. See also OECD (2001***).***

- Three large scale studies have shown that the smaller the class, the better the results, as measured by student performance on NAEP exams, again with no evidence of a threshold effect. According to these studies, there is no particular level to which a class size must be lowered to in order to raise achievement. [4]

- In Texas, there has been substantial progress in student achievement, particularly in the early grades, and particularly among minority students since the state implemented a program to reduce class size to 22 students in kindergarten through 4th grade in 1984. Researchers at RAND have identified that these gains in national assessments known as the NAEPs, along with increased access to Pre-K, were due to the Texas statewide class size reduction program.[5]

- In an observational study of 49 randomly chosen schools in Great Britain, the researchers found significant benefits of smaller classes among student engagement and time on task, and no evidence of threshold effects. [6]

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Knowledge and skills for life. First results from PISA 2000. Paris, pp. 202 - 205. The Programme for International Student Assessment (PISA) study (2000) of reading, mathematical and scientific literacy of 15 year olds in 32 countries found that as the student-teaching ratio rises above 25, there is a continuous decline in school performance in all three areas of reading, math and science. The PISA study predicted that a student score which is ten points higher in one school than another is associated with an average of 3.3 fewer students per teacher.

[4] Donald McLaughlin and Gili Drori, ***School-Level Correlates of Academic Achievement: Student Assessment Scores in SASS Public Schools,*** U.S. Department of Education, 2000; http://nces.ed.gov/pubs2000/2000303.pdf. David Grissmer, et.al., ***Improving Student Achievement: What State NAEP Test Scores Tell Us***, Santa Monica, CA: RAND, 2000, www.rand.org/publications/MR/MR924/ See also Harold Wenglinsky, ***When Money Matters,*** Educational Testing Service, April 1997; http://www.ets.org/research/pic/wmm.pdf

[5] David Grissmer, et.al., **op.cit.**

[6] Peter Blatchford et.al, "Do low attaining and younger students benefit most from small classes? Results from a systematic observation study of class size effects on pupil classroom engagement and teacher pupil interaction", presented to the American Educational Research Association Annual Meeting 2008, posted at http://www.classsizeresearch.org.uk/aera%2008%20paper.pdf