In the following annotated bibliography, Hanover Research presents recent notable empirical research, meta-analyses, and literature reviews on the relationship between class size and student achievement.
EXECUTIVE SUMMARY AND KEY FINDINGS

INTRODUCTION

In the following annotated bibliography, Hanover Research summarizes recent empirical research studies, meta-analyses, and literature reviews examining the relationship between class size and student outcomes.

The relationship between class size reduction (CSR) and student achievement is one of the most frequently researched topics in education. Hanover identified research studies concerning the interaction of class size and student achievement, as well as studies related to school size. The report includes recent publications from 2013 in addition to studies published in previous years that were not included in earlier Hanover reports. Content cited in previous Hanover reports on this subject is excluded.

This bibliography represents studies with varying conclusions. Some reports argue that class size has no effect on student achievement, some conclude that smaller classes are more beneficial, and several conclude that a larger class size benefits most students. Some researchers argue that CSR is most beneficial for a particular subset of students. There appears to be evidence of significant long-term effects on achievement when class-size is reduced by seven to 10 students, especially when the reductions take place in earlier grades—many studies focused on students in kindergarten through third grade. Other studies look at peer effects, class size, and educational achievement, rather than class size alone. However, the number of credible studies is small and they differ in design (e.g., setting, method, age and grade of students, class size, etc.), therefore conclusions should be made with caution.1

KEY FINDINGS

Below we summarize key findings from the recent literature included in this report:

- **Studies show that students from disadvantaged backgrounds benefit most from smaller class size and smaller school size.** Students with a lower socioeconomic status, who live in dissolved homes, and/or whose parents are educated at or below a secondary school level show the greatest benefits from small class and school size.

- **There are conflicting results as to whether smaller class size effects student achievement.** The included studies are divided between no measurable benefit, while others found the opposite to be true. However, according to the included

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literature reviews, it appears that overall more studies have found class size has no effect on student achievement.

- **Among students in high school, larger school size appears to benefit student performance in math, while size had no effect on student performance in reading.** The authors found the most profound effects on math and reading achievement to be correlated with socioeconomic status, school attendance, English language learner status (reading only), and institutional expenditure (math only).
SECTION I: ANNOTATED BIBLIOGRAPHY

CLASS SIZE

  This study from Sweden analyzes the long-term effects of class size in primary school. The authors found that a smaller class size for the last three years of primary school, ages 10-13, is beneficial for the cognitive and non-cognitive abilities of children at age 13, and has been linked to improved achievement at age 16. Furthermore, smaller class size was shown to have a positive effect on the total amount of education a child completes, as well as subsequent wages and earnings between the ages of 27-42.

  Using data from a Norwegian elementary school, the authors test whether students from disadvantaged backgrounds benefit from smaller classes. The data includes one cohort of fourth graders over the course of three years to determine whether students placed in a small class fare better than their peers placed in a large class. The authors found significant class size effects for two subgroups of students: those whose parents are educated at or below the upper secondary school level, and those from dissolved families. According to the Student Teacher Achievement Ratio (STAR) measures, the estimated effects for the former subgroup are smaller, while the effects for the latter subgroup are within the range reported from the STAR-studies. The authors conclude that although CSR are not an effective way to increase a student’s average performance, it can be used to improve the educational attainment of disadvantaged students by minimizing socioeconomic differences.

  This study takes place in a Midwestern school district with an increasing number of students moving into their district and a decreasing budget. To address these issues, the district opted to increase class size. The study’s aim was to determine if there “[i]s there a difference in student achievement based on common formative assessment data between smaller and larger classes?” by analyzing data from a 6th grade classroom during the 2012-2013 school year. The author found no difference in achievement by class size. However, he notes other
effects of class size, including an increase in disruptive behavior due to lower ratio of staff to students and an overall lack of materials.


  In this chapter, the author provides a brief synopsis of the literature on governmental policies that affect the financing of schools, particularly how student performance affects school finances. The majority of studies (three-quarters) that have measured the effect of student-teacher ratios, report no significant relationship with achievement. Whereas studies that do indicate a relationship between student-teacher ratios are evenly divided between those showing the expected negative impact of a higher ratio, and those showing a positive impact on student achievement.


  In this literature review, the authors argue that overall, smaller class sizes have a positive impact on student achievement. The purpose of this research study was to address issues of CSR in various states across the U.S., its effects on improving education, and to investigate the issues the State of Florida is facing with implementation under the A+ Plan and No Child Left Behind Act. The authors conclude that overall, smaller classes are beneficial to both students and teachers in primary grades, particularly in reading. Furthermore, teachers benefit from a lighter load of grading, which enables them to spend more time preparing lesson plans.

**Supplement to Tennessee’s Project STAR and Lasting Benefits Study**


  This policy brief provides a summary of over 20 years of work on one large-scale experiment that is supported by results from many shorter-term class-size studies: the Tennessee’s Student Teacher Achievement Ratio (STAR) experiment. The brief is comprised of the STAR experiment, a large-scale, randomized, longitudinal experiment, and its derivative studies (1985-2006). The authors argue that small classes of 15-17 students in Pre-K through grade 3 provide short- and long-term benefits for students, teachers, and society. Benefits are
particularly profound for poor minority and male students who show improvements to test outcomes and school engagement, and reductions in grade retention and dropping out of school.

SCHOOL SIZE

- Jackson, D.A. “Student Achievement and Fidelity of Implementation of the Middle School Concept in Middle Schools.” Dissertation, East Carolina University, May, 2013. http://thescholarship.ecu.edu/bitstream/handle/10342/1751/Jackson_ecu_0600D_10885.pdf?sequence=1

This study examined four middle schools in eastern North Carolina to determine whether (a) interdisciplinary teaming, (b) flexible scheduling, (c) advisor/advisee relationships, and (d) an integrative, exploratory, and challenging curriculum effects student performance. The author found that although the key features were being implemented in participating schools, the level of implementation was low. When implementation scores were compared to student achievement scores, the smallest middle school included in the study showed the highest level of student achievement, leading the author to infer that greater amounts of individual attention positively affects student achievement, despite low implementation levels of other key features.


This study examined the correlation between high school size and student achievement. The data set measured the reading and math scores of 11th grade students, as measured by the Prairie State Achievement Exam (PSAE). The study also examined whether socioeconomic status (SES), English language learner status, special education enrollment, mobility rate, dropout rate, class size, instructional expenditure per student, attendance rate, and/or school enrollment can be used to predict student achievement as measured by the PSAE. Regarding reading scores, the author found no relationship between school size and student performance; SES had the most significant effect, followed by school attendance, and then English language learner status. Regarding math scores, a relationship does exist between school size and performance, with large schools outperforming both small and medium schools; SES had the most significant effect, followed by student attendance, and then instructional expenditure. Finally, the study provides administrators with specific information regarding student and building characteristics to best predict student outcomes.
PROJECT EVALUATION FORM

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