Great Schools Issue Paper

Reduced Class Size

Research continues to show that class-size reduction in the early elementary grades can produce significant improvements in student achievement that last over a child's entire education. For this to happen, however, teachers must design their instruction to take advantage of the smaller numbers.

Some research suggests that smaller classes also can have a similar effect on older students. However, this evidence is less conclusive (see Educational Testing Service study below that shows positive results for smaller classes at the eighth grade level).

The discussion that follows considers four of these studies: Project STAR, the Lasting Benefits Study, Research by Educational Testing Service on the effects of class size reductions on student achievement, and the Student Achievement Guarantee in Education (SAGE) Program.

This is followed by summaries of three WEAC studies: Statewide Study of Elementary Class Sizes, Grades K-3; 1998 Study of Elementary Schools in Milwaukee, Grades K-5; and 1998 Intermediate and Secondary Class Sizes and Class Assignments in Wisconsin's Public Schools.

In reading about these studies, keep in mind that a 1998 study by *Education Week* awarded Wisconsin's public schools a grade of "C-" for "school climate," essentially because so many elementary teachers have classes of 25 or more. Another reason for the C- was due to more than half of high school English teachers teaching 80 or more students a day (Quality Counts, 1997).

Significant Research on Class Size

Project STAR: Tennessee's Project STAR, a four-year study of class-size effect, has produced the most compelling data yet on class size, effective teaching strategies, and the sustainability of early student achievement gains. The longitudinal study followed students from kindergarten in 1985-86 through the third grade in 1988-89. An additional study of the long-term effects of smaller classes was released in early 1999 (Pate-Bain, et al.). This study showed that the positive effects of smaller classes in the early elementary grades carried through high school.

Project STAR, authorized by the Tennessee Legislature, studied student achievement in three types of K-3 classes: small classes (13-17 students per teacher), regular classes (22-

25 students per teacher), and regular classes (22-25 students) with a teacher and a full-time teacher aide (Word, et al., 1990).

The project included 17 inner city, 16 suburban, eight urban, and 39 rural schools and involved 6,500 students in 330 classrooms. Students and teachers were randomly assigned to class types.

Student achievement effects were measured with three standardized instruments. By the end of the first grade, STAR students in small classes were outperforming students in regular and regular/aide classes by a wide margin. By grade three, the pattern established in the first grade had become firmly fixed. A strong class-size effect was evident in all school locations (urban, rural, inner-city and suburban) and for all students (Word, pp. 10-13).

Lasting Benefits Study: The Lasting Benefits Study (LBS) has continued to track students who participated in Project STAR from 1985-89 in order to determine whether the achievement advantages of students from the small classes were maintained after these students returned to regular-sized classes in the fourth grade. Data from 1990-1994 show that students who were originally in smaller classes continued to perform better than the students from regular-sized classes, with or without a teacher's aide **(**Mosteller, 1995, p. 125). As noted above, these benefits continue throughout high school.

Achilles (1996) argues that smaller classes may be cheaper in the long run because of the following: fewer students held back, fewer discipline problems, less need for remediation, higher levels of achievement (which last over time), and better attitudes on the part of teachers.

Educational Testing Service Study: In 1997, Educational Testing Service published a research study completed by Harold Wenglinsky in which he studied the relationship between spending and student achievement by analyzing data from three separate sources: National Assessment of Educational Progress, the Common Core of Data, and the Teacher's Cost Index of the National Center for Education Statistics. In all, he created data bases for 203 fourth grade districts and 182 eighth grade districts.

Wenglinsky's research shows that increased spending for smaller classes has a direct positive effect on student achievement for fourth grade students. Among eighth graders, the relationship is somewhat more complex, in that reduced class sizes improve the social environment leading to fewer problems and improved student achievement.

The SAGE Program: In June, 1995, the Student Achievement Guarantee in Education (SAGE) program was signed into law as a five-year pilot program. Participating districts receive $2,000 per student and are required to meet specific "contractual" requirements with the Department of Public Instruction and also to take part in an extensive evaluation of the program conducted by the Center for Urban Initiatives and Research at the University of Wisconsin-Milwaukee.

The program is intended to improve education by reducing class sizes in grades K-3 to no more than 15 students (in grades K-1 during 1996-97, grades K-2 in 1997-98, and grades K-3 in 1998-1999 through 2000-2001). In addition, districts had to agree to turn schools into "lighted schoolhouses" that are open for extended hours, to develop rigorous academic programs, and to establish and implement plans for staff development and accountability.

In order to participate, a school had to serve high percentages of low income children. The specific requirements for eligibility are defined in the State Statutes (s. 118.43 (2). During the 1996-97 school year, 30 schools from 21 school districts participated in the SAGE program. During the second year, 80 schools participated. Legislation to expand the program in the 1999-2000 school year is likely to pass.

Evaluation of the first two years of the program showed that students in the SAGE schools scored significantly higher than students in the comparison schools in reading, language arts, and mathematics (see DPI Web site at: www.dpi.state.wi.us/. For additional information, contact Professor Alex Molnar, SAGE Evaluation Office, School of Education, University of Wisconsin-Milwaukee, P.O. Box 413, Milwaukee, WI 53201, (414) 229-2220.

WEAC Class Size Studies

Statewide Study of Elementary Classes, Grades K-6

A study completed in 1997 of K-6 class sizes in Wisconsin's public schools had three noteworthy findings:

1. Ninety-two percent of Wisconsin's kindergarten classrooms currently exceed the standard established by Project STAR of 15 or fewer students. Statewide, classes at this level average 20-21 students. Twenty-seven percent of kindergarten teachers report classes of 25 or more.
2. For teachers in grades 1-6, the average class size is 22 students. In addition, the typical classroom has between five and six students who are classified as EEN (Exceptional Educational Needs) or ESL (English as a Second Language).Ninety-four percent of the self-contained classrooms exceed a 15 student maximum. Among teachers who meet with multiple classes each day, one-fourth meet with more than 125 students daily.
3. Class-size policies have been established by approximately 39 percent of Wisconsin's school districts. However, in 77 percent of the cases, 25 or more students are allowed in a classroom.

Study of Elementary Schools in Milwaukee, Grades K-5

In the spring of 1998, a study of K-5 classes in Milwaukee Public Schools (MPS) collected baseline data on class size and related issues from teachers of self-contained classrooms, kindergarten through fifth grade.(1) Excluded from the study were three

categories of teachers: teachers in the SAGE schools, teachers of students with Exceptional Educational Needs (who typically meet with small groups of students), and teachers who meet with multiple groups of students during the school day (e.g., teachers of art, music, or physical education).

Keep in mind that even though Exceptional Educational Needs teachers are not included in this study, most teachers who returned a questionnaire indicated that their classes include several students who are classified as EEN or ESL (English as a Second Language).

The most significant findings of this study are as follows:

1. Compared with the State of Wisconsin, MPS classes in grades K-5 are significantly higher. On average, MPS kindergarten classes average four to five more students than classes elsewhere in the state, while for grades one through five, classes in MPS are five students greater.
    - Among kindergarten teachers, the average class has approximately 25 students. (Statewide, the average class has approximately 21 students (mean = 21.7, median = 20/21, mode = 20).
    - For teachers in grades 1-5, the average MPS class has 27 students (mean = 27, median = 27, mode = 25). (Statewide, the average first through fifth grade, self-contained classroom has 22 students. Compared with the rest of Wisconsin, MPS first through fifth grade classrooms have an average of five more students).
2. MPS teachers feel their classes are far too large. They indicated that the maximum number of students in a class should be no greater than about 20 students. The ideal class size was targeted at 15-16 students among kindergarten teachers and 17-18 students for the other teachers. Few classes in MPS are this small.
3. Nine in ten teachers said they had too many students. In response to the question, "In terms of meeting the individual needs of all students, how do you feel about the number of students you currently teach?", not a single respondent said he or she had too few students.

1998 Intermediate and Secondary Class Sizes and Class Assignments in Wisconsin's Public Schools

At the end of the 1997-98 school year, 1,588 teacher members of WEAC participated in a study of intermediate and secondary class sizes. The most significant findings:

- The typical teacher (excluding Exceptional Education Needs teachers) met with five classes of 23 students each day. There is considerable variation in average class sizes across subject areas: art = 34, business education = 22, computer science = 21, English/language arts = 23, health/wellness = 27, home economics = 24, foreign language = 24, mathematics = 21, music = 35, physical education = 35, science = 22, social studies = 23, technology = 26, "other" = 22.

- The typical regular education teacher evaluated approximately 110 students during the second semester. The median number evaluated by subject area varies across subject areas: Art = 174, business education = 103, computer science = 103, english/language Arts = 108, foreign language = 112, health/wellness =83, home economics/family living = 114, mathematics = 101, music = 160, physical education = 165, science = 120, technology = 110.
- One-fourth of teachers say they have "too many students." A nearly equal proportion (27%) say they have "just about the right number," while only 2% say they have too few students. The remainder (47%) say that in some classes they have too many students while in other classes they have about the right number.
- Forty-three percent of teachers report that over the last three years their class sizes have increased. A slightly larger percent (48%) say classes have "stayed about the same." The remainder (9%) say class sizes have decreased.
- Teachers in small schools (with fewer than 400 students) tend to evaluate significantly fewer students than do teachers in larger schools. Their classes also tend to be significantly smaller.
- The average teacher has approximately one unscheduled hour at school each day. This same teacher spends six to ten hours outside of school each week in preparation for teaching.

Conclusion

Research shows that small classes at the early elementary grades can make a significant and long lasting difference in student achievement. This is the conclusion of those who evaluated the effects of Project STAR, a study that Frederick Mosteller, professor emeritus of mathematical statistics at Harvard University, has described as one of the most important educational investigations ever done (Mosteller, 1995, p. 113).

Although Project STAR showed significant positive effects for students in grades K-3, this does not mean that smaller classes might not have similar benefits at other grade levels. We simply don't know. What we do know is that much of the research at other grade levels on the effects of class size has not made use of classic, experimental designs, as was done with Project STAR). In addition, the studies usually have been of short duration and did not did not consider the effects of very small class sizes (13-17 students), as was done in the Tennessee research.

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Sources

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