

Staffing Model, Part A: Effective, Manageable Class Sizes

Resource Proposal

Improving student achievement involves many complex factors. A strong teacher development system and compensation that incentivizes knowledge and skills will have major impact. But manageable, appropriate class size must also be attained. Washington's class size ranks almost at the bottom in the nation, and must be addressed.

Superintendent Bergeson proposes to improve the state's funded class sizes consistent with the national average class sizes. Washington's teachers and students should not have to work/learn in classrooms so far beyond the national average. The proposed class sizes, which represent substantial reductions, are justified in light of the research on the cost-effectiveness of such reductions, fairness to teachers and students (see Appendix A for more information). However, by reaching the national average class size, rather than push class sizes down further, Washington can also invest resources in improving teacher compensation and enriching student learning opportunities. In doing so, schools must continue to have the authority and flexibility for schools to staff for classes appropriately depending on age, content, and student performance.

The proposed class size in a typical classroom for the various grade levels are as follows:

- The lowest student-teacher ratio for **K-3** classes is an average class size of 20.5 students.
- The lowest student-teacher ratio for **grades 4-5** is an average class size of 22.5 students.
- Overall, elementary schools (**K-5**) would average class sizes of 21.2 students using state funding for these ratios, which is still larger than the national average (estimated to be 20.4¹).
- The best student-teacher ratio data available for **grades 6-12** is 19.1 FTE students per teacher, which yields an average class size of 25.5 students.²
- For all grades together (K-12), the average class size produced using the proposed ratios would likely have 23.5 students.

¹ National Center for Education Statistics, "Schools and Staffing Survey (SASS), Public Teacher Questionnaire, 2003-04" (prepared in July 2006), in [Digest of Education Statistics 2007](#) (Table 64).

² The secondary ratio is similar to what is found in other states and programs. The average secondary class size nationally is about 25 students, and comprehensive school reform models are developed using 25 as the typical class size.

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Table 1 displays the current funded class size compared to recommended class size.

Table 1: Current and Recommended Students per Teacher Allocations, 2007-08

Students Per Teacher	Grades K-5	Grades 6-8	Grades 9-12
<i>Step 1:</i> Current ratio of students per staff per teacher after ESAs are deducted; assumes only 5 periods and 0 planning time for teachers	20.6	24.2	24.2
<i>Step 2:</i> Class size that is possible for 6 periods of instruction and 1 hour of planning time	24.7	29.0	29.0
<i>Step 3:</i> Impact of I-728 on improving class size	22.9	26.6	26.6
SPI Recommendation	21.2	25.5	25.5

Instructional coaches should be funded at a rate of 1 per 1,000 students.

The proposed funding structure differs from the current system in several ways.

- The state allocation for certificated instructional staff will continue to be a single allocation from the state to a school district based on staff to student ratios.
- The state allocation will be “unblocked” in a legislative document (presumably a LEAP document) that identifies:
 - The teachers needed to fund a stated class size assumption at grades K-5, 6-8 and 9-12, and
 - The workload assumption for librarians, instructional coaches, nurses, guidance counselors, and pupil support. (These staffing recommendations are contained in additional issue papers.)
- I-728 funds that are currently used to reduce class size would be incorporated into the funding formula driving class size staffing.

The proposal also assumes that additional staff will be funded to address the needs of struggling students, students eligible for special education, and English Language Learners.

Washington: Current Class Size

Washington provides state funds to districts for basic education certificated instructional staff (CIS) using different ratios for different grades (allocations for administrators and classified staff have separate ratios).³ The basic education CIS allocation ratios are shown in Table 2. Districts receive funding for grades K-4 at a ratio of 53.2 per 1000 students only if they demonstrate an actual ratio of at least that ratio. Districts with a lower ratio receive the funding for that ratio (or the minimum ratio). For small districts and remote schools, the formula also ensures a minimum number of CIS. The ratios are only for state allocation purposes. Districts are

³ Basic education certificated instructional staff means certificated teachers and certificated educational staff associates (ESAs) in the following programs: basic education, secondary vocational education, skills centers, general instructional support, and general supportive services.

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responsible for determining staff levels and must employ at least 46 CIS units per 1000 FTE students. *These ratios are for all certificated instructional staff, not just teachers.* As a result, the student-teacher ratio is higher than these ratios.

Table 2: Current Certificated Instructional Staff Allocations, 2007-08

Grades	Funded CIS per 1000 FTE students	Funded FTE Students per CIS
K-4	53.2	18.80
5-12	46.0	21.74

These ratios also are not the same as class size because the state allocates staff to cover 5 hours of instruction, and does not accommodate planning periods within the ratio allocation. Most school districts offer 6 hours of instruction, and most districts provide some planning time, frequently 1 hour. Districts must either hire more staff than the state funds in order to accommodate the six period day and planning time, or must increase class sizes in order to live within the number of staff that the state funds.

Other funds are used to help reduce the class sizes. I-728 funds can be used for several purposes, including lowering class sizes.⁴ These funds reached \$450 per FTE student in 2006-07. Each district determines how I-728 funding should be used. In addition, local and federal funds are often used to hire more staff, which reduces the ratios and class sizes even more.

The class size effects of various funding assumptions breakdown as shown in Table 3, for the true funded class size in basic education in step 3.

Table 3: Current Student per Teacher Allocations, 2007-08

Students per Teacher	Grades K-5	Grades 6-8	Grades 9-12
<i>Step 1:</i> Current ratio of students per staff per teacher after ESAs are deducted; assumes only 5 periods and 0 planning time for teachers	20.6	24.2	24.2
<i>Step 2:</i> Class size that is possible for 6 periods of instruction and 1 hour of planning time	24.7	29.0	29.0
<i>Step 3:</i> Impact of I-728 on improving class size	22.9	26.6	26.6

⁴ In November 2000, Washington voters approved Initiative 728 that dedicated a portion of the state property tax and state lottery revenues to the Student Achievement Fund. School districts can use the funds for six purposes: class size reductions in grades K-4, selected class size reductions in grades 5-12, extended learning opportunities for struggling students, professional development for educators, support for early learning activities, and improved or additional facilities to support smaller classes and extended learning opportunities.

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Washington does not explicitly fund an allocation for instructional coaches. This form of instructional improvement must also be deployed out of the overall ratio of 1 staff per 21.7 students (18.8 students at K-4). At the class sizes listed above (step 2 and 3), and based on how many ESAs and teacher-librarians that districts purchase, districts can deploy 1 instructional coach for each 1,250 students. At this ratio, at the elementary level, 1 coach would be assisting 47 teachers with improving curriculum and instruction and with their struggling students. At the secondary level, coaches would be assisting 9 teachers and the portion of 1,250 students that are struggling.

Instructional coaches are a component of class size improvement because the services they provide to teachers and students have a more tangible and immediate effect on instruction and student achievement than many other interventions. Research in other states is consistent with Washington's experiences with Reading First, a federal program that provides a range of assistance including coaches, in our lowest performing elementary schools. The coach provides the content expertise to assist all building teachers to identify the needs of struggling students and differentiate instruction accordingly.

Ratios in Other States

Compared to other states, Washington is seriously understaffed. Our overall student-*teacher* ratio continues to be one of the highest in the nation. As of 2006 (the most recent data available), Washington had 19.3 students per FTE teacher, which ranked 46th in the nation. Only Oregon, California, Arizona, and Utah had higher ratios. The ratio for the nation was 15.7 and the average for seven Global Challenge states was 15.1. (See Appendix B and C)

While the state has taken steps to reduce the ratio in grades K-4 over the years, other states have reduced their ratios as well. According to the National Center for Education Statistics (NCES), the student-teacher ratio in the United States has declined from nearly 27 to 1 in 1955 to 15.7 in 2006. Some of this decline is due to the increased availability of special programs where a teacher works with students individually or in small groups. Nevertheless, real declines have occurred in the average number of students in most classrooms across the nation. Some states have mandated smaller classes in elementary grades, and most of these efforts focused entirely on the primary grades (mainly K-3). For example, California initiated an effort in the late 1990s to reduce the size of all K-3 classrooms from about 29 to no more than 20 students.

Over the past five years, Washington's ratios have stayed about the same but those in other states have become slightly smaller. The figures below show the trends for Washington, the nation, and the Global Challenge states⁵. These ratios are based on funding for staff from all sources.

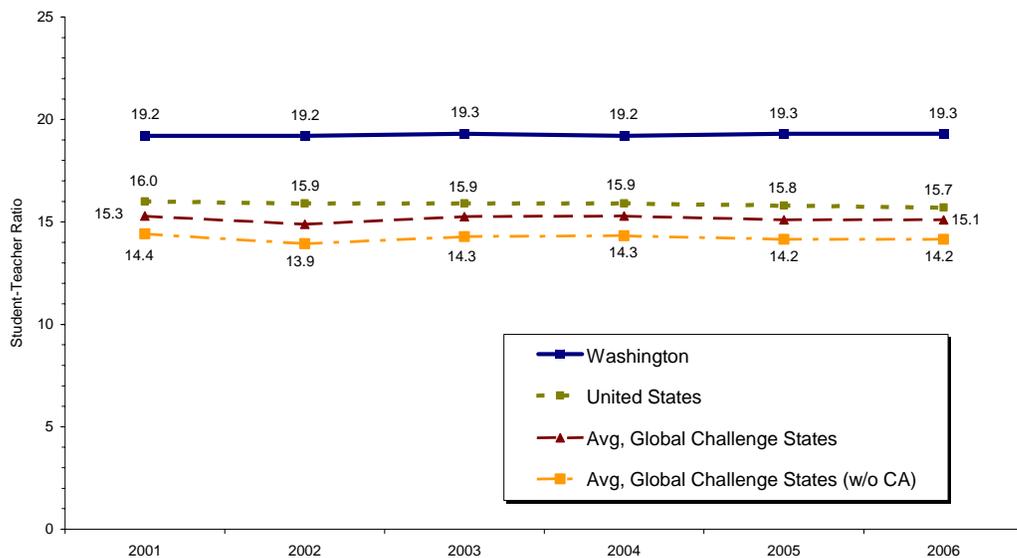
⁵ Washington Learns identified seven states as being our competitors in the global economy. The "Global Challenge" states were California, Connecticut, Colorado, Maryland, Massachusetts, New Jersey, and Virginia. According to the final Washington Learns report, Washington ranks second among all fifty states for its potential to compete on the New Economy Index, trailing only Massachusetts. But our high ranking is based on our potential, but our ability to reach our potential depends on education. These Global Challenge states have highly rated and well funded education systems.

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- Figure 1 shows the student-teacher ratios from 2001 to 2006 (Global Challenge state ratios both include and exclude California, which has very high ratios). Washington’s ratio is 23% larger than the nation and 36% larger than the Global Challenge states (excluding California).
- Figure 2 shows the estimated average class size assuming that class sizes are 33% larger than the student-teacher ratios shown in Figure 1.
- Figure 3 shows the student-staff ratios from 1999 to 2006.

Washington’s low per pupil expenditure rankings contribute to our above average class size.⁶

Figure 1: Student/Teacher Ratios, 2001-2006



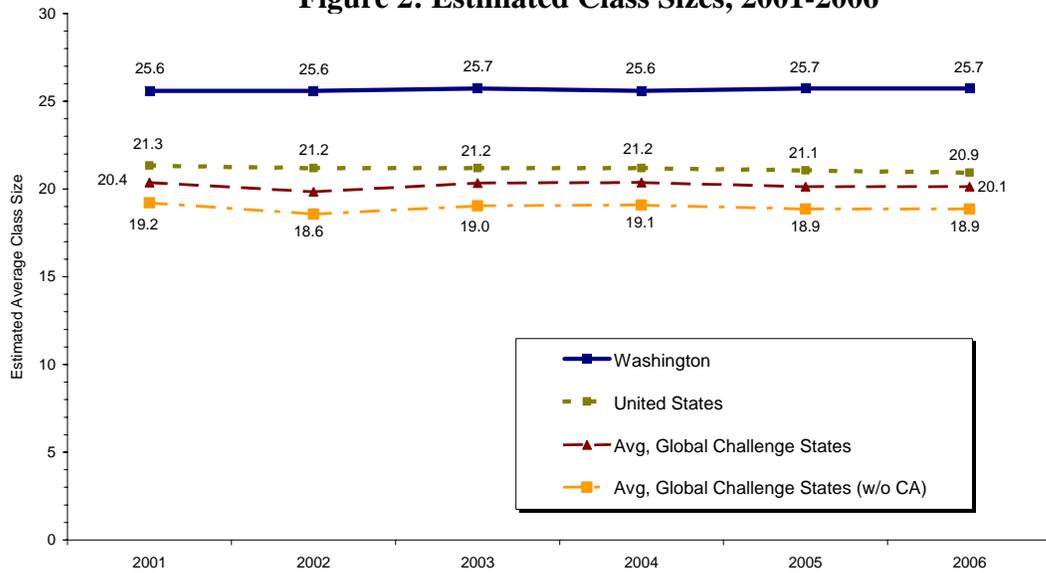
Note: Students are measured in terms of headcounts while teachers are in FTE. If students were measured in terms of FTEs, all the ratios would be smaller but the differences would stay the same.

Source: National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education" (prepared in July 2007).

⁶ In 2005, Washington spent 17.2% less than the national average and ranked 44th in total per pupil expenditures. Our spending was 22.2% less than the average of the seven Global Challenge states (25.4% less if California is excluded). The amounts and rankings adjusted for a state’s cost of living using the NCES Geographic Cost of Education Index. The relatively low level of expenditures in Washington is surprising in light of the state’s above-average per capita personal income. See NCES, Revenues and Expenditures for Public Elementary and Secondary Education: School Year 2004-05, April 2007; Education Week, Quality Counts, January 2008; and U.S. Dept. of Commerce, Bureau of Economic Analysis, "State Personal Income 2007," March 2008 (<http://www.bea.gov/newsreleases/regional/spi/2008/pdf/spi0308.pdf>).

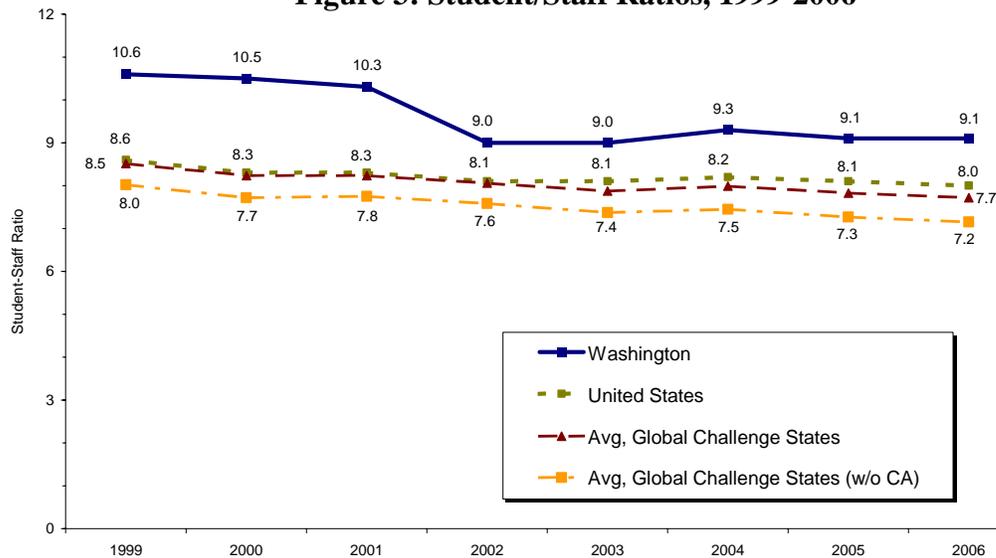
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Figure 2: Estimated Class Sizes, 2001-2006



Note: The estimated class size assumes it is 33% larger than the student-

Figure 3: Student/Staff Ratios, 1999-2006



Note: Students and staff are both measured in terms of headcounts.

Source: National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education" (prepared in July 2007).

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Implementation Issues

Given the increased cost of reducing class sizes, the potential for perverse outcomes, and the shortage of additional qualified teachers to fill the positions, any reductions should be phased over a period of several years. Initially, the reductions should occur in areas with the largest numbers of low-achieving students that are in large classes. Given the strong relationship between poverty and student achievement, implementing the smaller classes should begin in schools with the highest numbers of low-income students in large classes, particularly in the early grades where research has shown the smaller classes have the greater impact. (Many low-income students are already enrolled in schools with small classes.)

Implementation also needs to have flexibility and not mandate schools have a maximum class size. If, for example, the desired K-3 class had 20 students and there were 42 students in a grade, a school would be forced to have 3 classes with an average of 14 rather than two classes of 21 if a 20-student maximum was mandatory. This type of inflexibility would create havoc at the school level where space may be in short supply and would be prohibitively expensive. A better alternative is to allocate funds based on a district average in order to permit variation to occur within and between schools. One researcher concluded that “establishing an appropriate class size is, at the very least, a balancing act between contemporary fiscal realities and children’s developmental needs, which vary considerably depending upon their life circumstances” (Ready, 2008, op cit.).

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Appendix A

Research on Class Size

Most research on the effects of reduced class sizes has focused on the primary grades (K-3) and for disadvantaged students. This research has generally found that smaller classes for these grades and students help improve student performance. For example, the Tennessee Student-Teacher Achievement Ratio (STAR) program used a true experimental design to study the impact of smaller classes and found that student performance improved in smaller K-3 classes, and the gains endured through later years. After one year in kindergarten, classes with 15 students performed 5-8 percentile points better on standardized tests than students in classes with 22-24 students (roughly one percentage point per student reduction). Wisconsin's SAGE program, another program with an experimental design, targeted class size reductions to low-income schools and found that student achievement increased faster than in similar schools with larger classes. Students who live in low-income families often begin school with fewer academic skills and lose more ground during the summer months compared to their more advantaged peers, so addressing the initial achievement gap means *accelerating* learning among these children over a several year period. Research has demonstrated that having smaller classes for these students is one way to accelerate their learning.⁷ As a result, reducing the student-teacher ratio in the early grades has become a popular initiative among states.

Relatively little research has been done on the impact of smaller classes at the secondary level, and this research has found the impact is relatively small. However, a 2008 study found that smaller classes also have benefits at the secondary level, especially for low-achieving students. According to this research, "adding five pupils to a class increases the odds of less academic pupils being 'off task' by 40 per cent." This requires a teacher to spend more time in classroom management and less time on instruction. Off-task behaviors had a much larger negative impact at the secondary level than in the primary grades.⁸

Although smaller classes may have an impact in upper grades as well, the issue is more complicated. Secondary staff have multiple classes with different students, which inhibits the creation of in-depth relationships between student and teacher that often occur at the elementary level. A secondary teacher with five classes of 27 students will have 135 different students. So the scarcity of research on class size effects at the secondary level does not mean smaller classes would not result in better student outcomes. Much more research is needed to determine when smaller secondary classes have a noticeable impact on student achievement. Common sense says that the more attention a teacher can provide to a student, the more likely the student will perform at higher levels. The movement to make high schools smaller in order to establish better relationships is a movement that recognizes the need for more "smallness" at the secondary level.

⁷ For a recent summary of this research, see Ready (2008), [Class-Size Reduction: Policy, Politics, and Implications for Equity](http://www.schoolfunding.info/policy/Poverty/Ready-ClassSizeResearchReview.pdf) at <http://www.schoolfunding.info/policy/Poverty/Ready-ClassSizeResearchReview.pdf>.

⁸ See Blatchford (2008), University of London Institute of Education, http://ioewebserver.ioe.ac.uk/ioe/cms/get.asp?cid=1397&1397_1=18878.

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There is not enough research to establish the optimum class size. Estimates of the ideal class size range from as low as 15-17 students per class (mainly because of the size of the classes in the Tennessee study) up to 23-25 students per class. High-performing Asian countries have very large classes but students are generally well-behaved and focused on their work, so teachers can have more one-on-one interactions with students and not worry as much about classroom management. Moreover, the total number of students they teach may also be fewer because teachers have fewer classes.⁹ The class-size reduction programs that have been experimental in design have not examined reductions from large to medium-sized classes. However, research that has looked at reductions from large to medium-sized classrooms has found benefits for students in smaller classes.¹⁰ After examining many studies on class size, some researchers concluded that it takes large reductions to substantially improve performance.¹¹

Reducing class sizes is a cost-effective educational investment. Research by the Washington State Institute for Public Policy (WSIPP) found that K-2 class size reductions yield \$2.79 in benefits for each \$1 of cost, which is nearly double the rate of return of the S&P 500 stock market index. Reductions in grades 3-6 also yield rates of return exceeding the S&P 500 index—\$1.38 in benefits for each \$1 in cost, according to WSIPP’s analysis. Moreover, the benefits increased rapidly as the level of students from low-income families in a school increased.¹²

However, when researchers control for external factors and then compare the influence of education-related factors to each other, teacher quality had a more powerful influence on student performance compared to reducing the student-teacher ratio.¹³ Ferguson (1991) found that the effects of teacher expertise in Texas were so great that when controlling for socioeconomic status, the differences in achievement between black and white students were almost entirely explained by differences in teacher qualifications. Investments in

⁹ See Kang and Hong, “Achieving Excellence in Teacher Workforce and Equity in Learning Opportunities in South Korea,” in Education Researcher, May 2008) for more information about the differences between the U.S. and South Korean education systems. For example, lower secondary teachers in Korea averaged 36 students per class but taught fewer classes because they spent much more time in planning. Overall, these South Korean teachers were in the classroom 3-4 periods a day (out of 6-7 periods) and spent about half the time teaching compared to U.S. teacher at the lower secondary level. The student-teacher ratio in Korea is much larger in the primary grades compared to the secondary grades, according to OECD Education at a Glance 2007.

¹⁰ See Ready and Lee (2007), “Optimal Context Size in Elementary Schools: Disentangling the Effects of Class Size and School Size,” in Loveless & Hess (Eds.), Brookings Papers on Education Policy, 2006/2007.

¹¹ See Odden (1990), “Class Size and Student Achievement: Research-Based Policy Alternatives,” in Educational Evaluation and Policy Analysis; Hanushek (1999), “Some Findings From an Independent Investigations of the Tennessee STAR Experiment and From Other Investigations of Class Size Effects,” in Educational Evaluation and Policy Analysis; Ferguson & Ladd (1996), “How and Why Money Matters: An Analysis of Alabama Schools,” in Ladd, Holding Schools Accountable; and Odden & Busch (1998), Financing Schools for High Performance.

¹² See Washington State Institute for Public Policy (March 2007), “Benefits and Costs of K-12 Educational Policies: Evidence-Based Effects of Class Size Reductions and Full-Day Kindergarten” at <http://www.wsipp.wa.gov/rptfiles/07-03-2201.pdf>.

¹³ See Darling-Hammond (2000), “Teacher Quality and Student Achievement: A Review of State Policy Evidence,” in Education Policy Analysis Archives; Greenwald, Hedges, & Laine (1996), “The Effect of School Resources on Student Achievement,” in Review of Educational Research; and Ferguson (1991), “Paying for Public Education: New evidence on How and Why Money Matters,” in Harvard Journal on Legislation.

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teacher quality are also more cost effective. An analysis of 60 well-designed studies found that increasing the teacher education level had more than five times the impact per dollar spent than lowering the student-teacher ratio.¹⁴ WSIPP also found that teacher quality had a much stronger impact.¹⁵

Making substantial reductions in class sizes can also be quite expensive and create undesired consequences if not done carefully. In most cases, reducing the size of class in a significant manner means hiring more teachers and increasing capital costs. The addition of more teachers becomes progressively more expensive as the student-teacher ratio decreases. More facilities and a different use of space may also be required to accommodate the extra classes, which could create higher capital costs. When California reduced class sizes in K-3 classes from 29 to 20, school districts turned libraries, gyms, and other spaces into classrooms and purchased portable classrooms to provide space for more classes. Its reduction program also resulted in an increase in uncertified teachers, a shortage of substitute and bilingual teachers, movement of more experienced teachers to schools and districts perceived to have better teaching environments, and a shift of teachers from secondary to primary schools and from special education to regular education. If lowering class sizes result in a less-qualified teaching force in schools that need high-quality teachers the most, the impact of having smaller classes in these schools will be reduced.

Finally, other factors besides student-staff ratios have been shown to improve student learning. Research has found common characteristics in schools that have high levels of student achievement. These relate to the school's leadership, culture and expectations, the alignment of standards and instruction, effective professional development, and the involvement of family members and the community.¹⁶ Various schoolwide reform models have been used to help create the necessary changes. The combination of three factors—smaller classes, better teacher quality, and schoolwide reforms—can work together to make substantial improvements in student achievement.

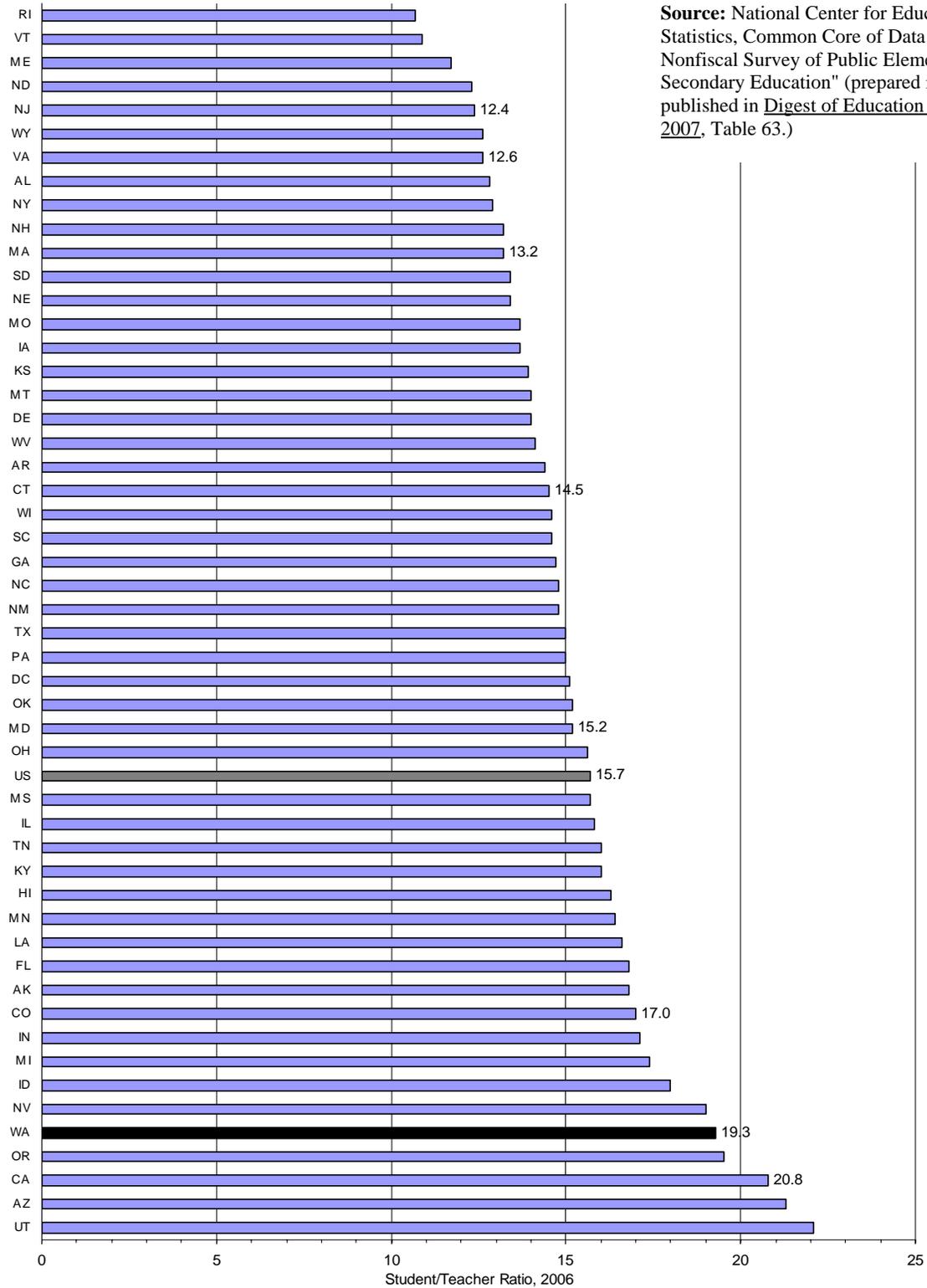
¹⁴ Greenwald, Hedges, & Laine, op cit.

¹⁵ See the effect sizes in WSIPP's March 2007 study (op cit.) and its December 2007 report, "Report to the Joint Task Force on Basic Education Finance: School Employee Compensation and Student Outcomes" at <http://www.wsipp.wa.gov/rptfiles/07-12-2201.pdf>.

¹⁶ See OSPI's publication *Nine Characteristics of High-Performing Schools* (2007).

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Appendix B National Ranking of Student/Teacher Ratios (2005-06)



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Appendix C National Ranking of Student/Staff Ratios (2005-06)

