

Warmup:

On a 10-point high-stakes test where minimum passing score is a 7, which teacher's class did better?

Mr. Jones' 5 students' scores were: 2,3,7,7,7.

Ms. Gomez' 5 students' scores were 5,5,6,6,10.

“Student Test Performance”

Who did better, Amy or Bob?

	fall	fall	spring	spring
TESTS	Amy	Bob	Amy	Bob
passed	5	9	7	3
taken	6	12	14	7

Who did better, Amy or Bob?

	fall	fall	spring	spring	full year	full year
TESTS	Amy	Bob	Amy	Bob	Amy	Bob
passed	5	9	7	3	12	12
taken	6	12	14	7	20	19
	$5/6 >$	$9/12 ;$	$7/14 >$	$3/7 ;$	but $12/20 <$	$12/19$

take-aways

- Clarify what “doing better” means:
for test pass rate each term: Amy did better
for annual test pass rate: Bob did better
for *number* of tests passed: they tied overall
- Make decisions carefully of when/how to group

Let's try another problem....

that's been in the news a lot

(e.g., recent front page of

El Paso Times)



4 area districts seek waivers for class sizes to save money

p. 1A **By Alex Hinojosa**
EL PASO TIMES 1/3/2012

From layoffs to wage freezes, area school districts say they have already done everything to absorb the \$4 billion in cuts mandated by state lawmakers.

Now, in an effort to save thousands more, four school districts have asked for class-size exception waivers from the Texas Education Agency. The authority to put more students in a single class will garner a savings of more than \$660,000, officials said. Those districts are El Paso, Clint, Fabens and Canutillo.

For each approved waiver, districts save an average of \$60,000 or what would be an average teacher's salary with benefits. The savings comes by simply adding one or two students to other classes. The four area districts are among 282 school districts throughout the state to request them.

These class-size waivers allow schools to surpass the 22:1 cap for the student-to-teacher ratios in grades K-4. There is no cap set for teachers or students in higher grade levels.

Smaller classes = higher scores

Study finds that fewer students also raises college aspirations

ASSOCIATED PRESS

WASHINGTON — Students in smaller classes will do better than their peers right through high school graduation, researchers on a decade-long Tennessee project said Thursday.

Students in classes ranging from 13 to 17 pupils have higher grades, better graduation rates and are more likely to attend college, researchers said.

"In high school, these are the students taking honors English, advanced mathematics and foreign languages," said Jayne Boyd-Zaharias, a lead researcher on Project STAR, which studied 11,000-plus students since the 1985-86 school year.

The results came amid national debate about how smaller classes fit into the overall improvement of schools.

Touting the study's results, the

Clinton administration and Senate Democrats on Thursday called for \$1.4 billion more for the president's plan to reduce class size to a nationwide ratio of 1 teacher for 18 students. The six-year plan to hire 100,000 new teachers would cost more than \$11 billion.

"We are urging Congress to finish the job," said Education Secretary Richard W. Riley.

Last year, a \$1.2 billion "down payment" for 30,000 teachers received money in a spending bill approved by Congress. But Republican misgivings about the Clinton proposal could hurt its chances this year.

"There is little point to reducing class size if we don't have quality teachers," said Rep. Bill Goodling, R-Pa., chairman of the House Education and Workforce Committee.

The committee heard Thursday from experts who differed on whether small classes are the only factor in giving children a good education.

Efforts to reduce class sizes can hurt teacher quality, say other lawmakers.

In California's push to add teachers to create smaller classes, schools sought waivers on what requirements teachers had to have, said Joe Karpinski, spokesman for the Senate Republican education panel.

"That resulted in more adults in the classroom, but not necessarily more qualified teachers in the classroom," Karpinski said.

He said the Senate wants to focus on the long-standing federal education programs set to be renewed this year.

The administration has not introduced its plans for the programs, which include help for poor, bilingual and migrant students.

Jim Manley, a spokesman for Sen. Edward M. Kennedy, D-Mass., said the class-size proposal could help all groups of children learn better.

The small-class study also found that minority and poor students were helped even more by small classes in some areas than other groups of children.

Black students in small classes were much more likely to pursue college, said Princeton's Alan Krueger, who tracked college entrance test data. Low-income students also took more SAT and ACT tests than their peers in larger classes.

But although all small-class students took more college entrance exams, their scores were not necessarily higher, he said. Bigger pools of test-takers could include students not used to taking such tests, he said.

The Tennessee public-school students were randomly placed in three class-size groups: a regular-size group with 22 to 25 students, a regular-size group with a classroom aide for the teacher and a small group with 13 to 17 pupils.

Tennessee's K-3 Class Size Study: The Student Teacher Achievement Ratio (STAR) project

large-scale, 4-year (K,1,2,3) study of reduced class size funded by the TN Gen. Assembly and conducted by the TN DOE, starting in 1985-86 school year

7,000+ students in 79 schools (and the teachers) randomly assigned into one of 3 interventions:

small class (13 -17 students per teacher),

regular class (22 -25 students per teacher),

regular-with-aide class (22 -25 students with a full-time teacher's aide)

result: significant ($p < .01$) student achievement advantage (about $\frac{1}{4}$ to $\frac{1}{3}$ of a SD) for small classes, maintained a full year after small classes disbanded

Follow-up: Compared to the other 2 cohorts, students from the small (K-3) classes were less likely to fail a grade level or be suspended, and also found to make better grades in high school, take more advanced courses in high school, have better high school graduation rates, and be more inclined to pursue higher education.

www.heros-inc.org/star.htm

“Average Class Size” Exploration (Lesser, 2009, 2010a)

What would you say is the ‘average class size’ for a very small school with 20 students divided among 4 rooms as:

3, 3, 4, 10

what's Average Class Size?

Room 1: 3 kids

Room 2: 3 kids

Room 3: 4 kids

Room 4: 10 kids

answers I usually get: 5 (mean),

4 or 3.5 (median), 3 (mode), 6.5 (midrange)

Average per *what*?

	mean	median	mode
Class	5	3.5	3
Student	?	?	?

Preceding answers were on per-class basis: {3,3,4,10}.

Now, have students use a “per-student basis” with:

{3,3,3, 3,3,3, 4,4,4,4, 10,10,10,10,10,10,10,10,10,10}

Al,Bob,Carl,Dee,Ed,Flo; Gil,Hal,Ivy,Jo; Kay,Lia,Mo,Ned,Olga,Pat,Qing,Ray,Sue,Ted

Average class size per.....?

	mean	median	mode
Class	5	3.5	3
Student	$134/20 = 6.7$	$(10+4)/2 = 7$	10

{3,3,4,10} for per-**class** basis

{3,3,3, 3,3,3, 4,4,4,4, 10,10,10,10,10,10,10,10,10,10} for per-**student** basis

whole-class debrief

- Ambiguity of the word “average”: need to specify not only *which* average, but also *basis unit* over which you are averaging!
- Which basis results in a larger number?
- Which basis is more useful for consumers?
- How to count auditing students, online courses, lab/recitation sections, etc.?
- Connection to “student-teacher ratio”?

what if we shuffled the 20 students

so that $\{3,3,4,10\}$ becomes $\{1,1,1,17\}$?

Which goes up, down, or stays the same?

- per-class mean, median, mode
- per-student mean, median, mode

{3,3,4,10}	mean	median	mode
per-Class	5	3.5	3
per-Student	$134/20 = 6.7$	$(10+4)/2 = 7$	10

{1,1,1,17}	mean	median	mode
per-Class	5	1	1
per-Student	$292/20 = 14.6$	17	17