

# U.S. Performance in International Comparisons: An Overview

The popular wisdom holds that U.S. students are losing ground internationally, but what do the data say?

BY GERALD W. BRACEY

“In America today, the longer you stay in school, the dumber you get relative to your peers in other industrialized nations.” Thus spoke Bill Bennett in a speech at the Heritage Foundation. His words have spread throughout U.S. culture and become part of conventional wisdom. They rest on a single problematic study.

The data reside in the original Third International Mathematics and Science Study (TIMSS). (I say *original* because the study is now repeated every four years. And *Third* has been changed to *Trends in*.) In that 1995 study, which published results from 1996 through 1998, U.S. fourth-graders were above average in math among 26 countries and third in science. U.S. eighth-graders were smack in the middle in both areas, and U.S. high school seniors were apparently at or near the bottom in math and science literacy, physics, and advanced mathematics. Hang on to the word *apparently*.

This TIMSS report was titled *Mathematics and Science Achievement in the Final Year of Secondary School*. The title tacitly acknowledged that the meaning of the final year of secondary school varies. The report explicitly acknowledged different meanings and noted the difficulty in comparing that final year across systems, and no one has tried to make such a comparison since, although a TIMSS special project is planned for 2008.

## International Differences

In the United States, most students move from the eighth grade into a comprehensive high school. In other nations, students move into differentiated curricula in different buildings—vocational, technical, college-bound. Students in some countries were 17 years old, in others, students were 21 (Iceland). Some secondary programs lasted three years, some five.

U.S. students differed from students

in virtually all other nations (between 16 and 21 countries participated, depending on the topic) in one non-school variable that the study assessed: hours spent working at a paid job. In most nations, you are either a student or a worker, not both. For example, 84% of the Swedish students did not work. But 55% of the U.S. students said they worked more than 20 hours a week—27% of them worked more than 35 hours a week. The research indicates that in the United States, working up to 20 hours a week improves school performance, even when social class variables are factored out. Work more than 20 hours a week, however, and earning starts to interfere with learning.

In math and science literacy, U.S. students who worked fewer than 20 hours a week scored 506, compared to an international average of 500. Those who worked 21–35 hours a week logged in at 474; and those laboring more than 35 hours earned a mere 448. None of the four Asian nations that participated at the eighth-grade level took part in the final-year assessment, so the international average is likely lower than if they had taken part. (They were busy



**Gerald W. Bracey** ([gbracey1@verizon.net](mailto:gbracey1@verizon.net)) is an independent researcher and writer, an associate of the High/Scope Educational Research Foundation, and a fellow with the Education Policy Studies Laboratory at Arizona State University–Tempe.

with their own life-determining tests.) Still, the U.S. rank when examining like against like is pretty much where it was at the eighth-grade level—average.

Although nations were supposed to choose representative samples for the math and science literacy assessment, they were allowed to choose whom to assess in advanced mathematics. The United States chose to assess students in calculus and pre-calculus classes. When I asked a staff member at the National Science Foundation why the United States tested pre-calculus classes, I was told that they wanted “just to see how they’d do.” Well, they did awful. They scored 100 points below U.S. students who actually had calculus under their belts. Those students, who were most similar to their European counterparts, were, again, at the international average.

One other thing might have lowered U.S. scores: In the spring of their final year, students in many countries are preparing for important tests, but seniors in this country have long since passed any important decision points. Hence the onset of the apparently uniquely U.S. phenomenon: senior slump. TIMSS tested U.S. seniors in May—in May!—of their senior year with a test that was meaningless to them, their parents, and their teachers.

None of these niceties were brought forth in the U.S. Department of Education press conference. Instead, it sounded like 12th-grade students in the United States had gone up against 12th-grade students from the other countries and gotten stomped and that the best 12th-grade students in the United States had gone up against the best 12th-grade students in the other countries and gotten stomped. The reality was a bit more complex.

Readers of this column can understand why no one has attempted to repeat this final-year assessment—the systems are too different across nations to permit really meaningful comparisons—but the cliché lives on.

### Disaggregating the Data

Both the 2001 and the 2004 PISA (Programme for International Student Assessment) and the 1999 and 2003 iterations of TIMSS have generally found that U.S. 8th-grade students (TIMSS) and 10th-grade students (PISA) are average in math and above average in science. PISA found them average in reading as well, but the 2004 Progress in International Reading Literacy Study (PIRLS) found that U.S. 4th-grade students were ninth among 35 nations, with only three countries having statistically significantly higher scores. A 1992 reading study—*How in the World Do Students Read?*—found that U.S. 4th-grade students were second in reading among 27 countries and that 8th-grade students were ninth among 31 countries. The 2003 TIMSS has found that U.S. 4th-grade students were above average in math and science. In all of these comparisons, between 35 and 45 countries participated.

So why is there a drop-off in performance from elementary to middle level school relative to what happens in other nations? It’s a bit of conjecture, of course, but I would offer two reasons: First, U.S. textbooks are about three times as thick as those in other nations. I’m sure readers have seen many cartoons in which U.S. children struggle to carry backpacks laden with thick tomes. As they march through school, students receive thicker and thicker books. Second, textbook publishers, hoping to sell to the widest possible

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market, take a kitchen-sink approach to content. Teachers try to cover it all, and coverage is briefer than it needs to be. Part of TIMSS looked at topic coverage in Germany, Japan, and the United States, and U.S. teachers attempted to teach many more topics than either other country.

If one disaggregates the scores by ethnicity, one finds that White students' scores compete well against those of students in the highest-ranking nations. If one looks at scores by poverty level, the outcomes are even more dramatic. The impact of poverty on achievement at the international level is presented in figure 1.

Thus students in schools in which fewer than 10% of the students live in poverty score well above the highest-scoring nation (Sweden). Students in the next poverty category score a little above the highest nation. Students in the 25%–50% poverty schools scored 551. If those students constituted a nation, it would have ranked fourth among the 35 countries. Only when looking at the scores of students from schools where more than 75% of the students are eligible for free and reduced-price meals do the scores fall below the international average.

One might look at this table and say, “Yes, but other countries have poor kids too.” True enough, but not as many. Or, more accurately, other nations have stronger social safety nets that transfer wealth to diminish poverty. For example, a UNICEF study found that 26.6% of U.S. children under the age of six live in poverty. The U.S. safety net programs reduced that to 21.9%. Denmark, by contrast, had 11.8% of its children in poverty, but taxes and welfare programs reduced that ultimately to 2.4%. (*Poverty* was defined as an annual family income of less than half of the median family income in each country.)

The far right column lists the percentage of students in each category. Thus, 30% of U.S. students had an average score that was higher than the average of the highest-scoring nation and 58% scored as well as or better than the top three nations.

U.S. reports on TIMSS and PIRLS are at <http://isc.bc.edu>. An international report is at [www.pirls.org](http://www.pirls.org). PISA reports are at [www.pisa.oecd.org](http://www.pisa.oecd.org).

### Average Is a Statistic

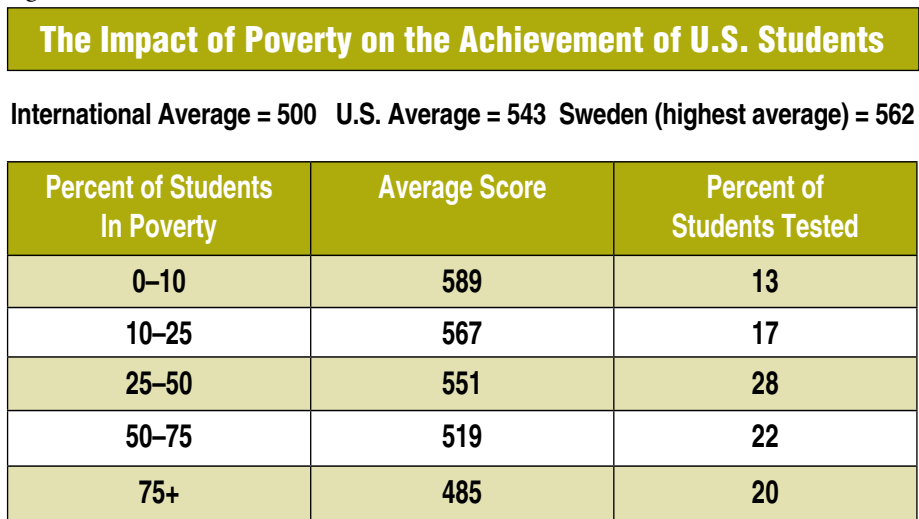
A note on ranks versus scores: ranks force differences on outcomes. If there

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are 35 nations in a study, some country must rank 35th. Its score could still be acceptable. The impact of ranking is seen most clearly in the original TIMSS eighth-grade science results. U.S. students got 58% of the items right compared to an international average of 56%, and this score ranked them 19th among the 41 countries. Had they managed a mere 5% more correct, they would have soared to 5th; if they had scored 5% fewer correct, they would have plummeted to 30th.

So, the performance of U.S. students on most international assessments is average. The media and critics invariably change this to “mediocre,” but average is a statistic and mediocre is a judgment. Is this performance a cause for concern? Certainly many people think so, at least in terms of our ability to compete in the global

Figure 1



marketplace. “If only to keep and improve on the slim competitive edge we still retain in world markets, we must dedicate ourselves to the reform of our educational system,” write the authors of *A Nation at Risk*. In late 2004, “Math + Test = Trouble for the

U.S. Economy” was a headline in the *Christian Science Monitor*. Next month we will examine how well those claims stand up to scrutiny. **PL**

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