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Top Test Scores From Shanghai Stun Educators

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With China's debut in international standardized testing, students in Shanghai have surprised experts by outscoring their counterparts in dozens of other countries, in reading as well as in math and science, according to [the results](#) of a respected exam.

American officials and Europeans involved in administering the test in about 65 countries acknowledged that the scores from Shanghai — an industrial powerhouse with some 20 million residents and scores of modern universities that is a magnet for the best students in the country — are by no means representative of all of China.

About 5,100 15-year-olds in Shanghai were chosen as a representative cross-section of students in that city. In the United States, a similar number of students from across the country were selected as a representative sample for the test.

Experts noted the obvious difficulty of using a standardized test to compare countries and cities of vastly different sizes. Even so, they said the stellar academic performance of students in Shanghai was noteworthy, and another sign of China's rapid modernization.

The results also appeared to reflect the culture of education there, including greater emphasis on teacher training and more time spent on studying rather than extracurricular activities like sports.

"Wow, I'm kind of stunned, I'm thinking Sputnik," said Chester E. Finn Jr., who served in President Ronald Reagan's Department of Education, referring to the groundbreaking Soviet satellite launching. Mr. Finn, who has visited schools all across China, said, "I've seen how relentless the Chinese are at accomplishing goals, and if they can do this in Shanghai in 2009, they can do it in 10 cities in 2019, and in 50 cities by 2029."

The test, the Program for International Student Assessment, known as PISA, was given to 15-year-old students by the Organization for Economic Cooperation and Development, a Paris-based group that includes the world's major industrial powers.

The results are to be released officially on Tuesday, but advance copies were provided to the news media a day early.

"We have to see this as a wake-up call," Secretary of Education Arne Duncan said in an interview on Monday.

"I know skeptics will want to argue with the results, but we consider them to be accurate and reliable, and we have to see them as a challenge to get better," he added. "The United States came in 23rd or 24th in most subjects. We can quibble, or we can face the brutal truth that we're being out-educated."

In math, the Shanghai students performed in a class by themselves, outperforming second-place Singapore, which has been seen as an educational superstar in recent years. The average math scores of American students put them below 30 other countries.

PISA scores are on a scale, with 500 as the average. Two-thirds of students in participating countries score between 400 and 600. On the math test last year, students in Shanghai scored 600, in Singapore 562, in Germany 513, and in the United States 487.

In reading, Shanghai students scored 556, ahead of second-place Korea with 539. The United States scored 500 and came in 17th, putting it on par with students in the Netherlands, Belgium, Norway, Germany, France, the United Kingdom and several other countries.

In science, Shanghai students scored 575. In second place was Finland, where the average score was 554. The United States scored 502 — in 23rd place — with a performance indistinguishable from Poland, Ireland, Norway, France and several other countries.

The testing in Shanghai was carried out by an international contractor, working with Chinese authorities, and overseen by the Australian Council for Educational Research, a nonprofit testing group, said Andreas Schleicher, who directs the Organization for Economic Cooperation and Development's international educational testing program.

Mark Schneider, a commissioner of the Department of Education's research arm in the George W. Bush administration, who returned from an educational research visit to China on Friday, said he had been skeptical about some PISA results in the past. But Mr. Schneider said he considered the accuracy of these results to be unassailable.

"The technical side of this was well regulated, the sampling was O.K., and there was no evidence of cheating," he said.

Mr. Schneider, however, noted some factors that may have influenced the outcome.

For one thing, Shanghai is a huge migration hub within China. Students are supposed to return to their home provinces to attend high school, but the Shanghai authorities could increase scores by allowing stellar students to stay in the city, he said. And Shanghai students apparently were told the test was important for China's image and thus were more motivated to do well, he said.

"Can you imagine the reaction if we told the students of Chicago that the PISA was an important international test and that America's reputation depended on them performing well?" Mr. Schneider said. "That said, China is taking education very seriously. The work ethic is amazingly strong."

In a speech to a college audience in North Carolina, President Obama recalled how the Soviet Union's 1957 launching of Sputnik provoked the United States to increase investment in math and science education, helping America win the space race.

"Fifty years later, our generation's Sputnik moment is back," Mr. Obama said. With billions of people in India and China "suddenly plugged into the world economy," he said, nations with the most educated workers will prevail. "As it stands right now," he said, "America is in danger of falling behind."

If Shanghai is a showcase of Chinese educational progress, America's showcase would be Massachusetts, which has routinely scored higher than all other states on America's main federal math test in recent years.

But in a 2007 study that correlated the results of that test with the results of an international math exam, Massachusetts students scored behind Singapore, Hong Kong, South Korea, Taiwan, and Japan. Shanghai did not participate in the test.

A 259-page Organization for Economic Cooperation and Development report on the latest Pisa results notes that throughout its history, China has been organized around competitive examinations. "Schools work their students long hours every day, and the work weeks extend into the weekends," it said.

Chinese students spend less time than American students on athletics, music and other activities not geared toward success on exams in core subjects. Also, in recent years, teaching has rapidly climbed up the ladder of preferred occupations in China, and salaries have risen. In Shanghai, the authorities have undertaken important curricular reforms, and educators have been given more freedom to experiment.

Ever since his organization received the Shanghai test scores last year, Mr. Schleicher said, international testing experts have investigated them to vouch for their accuracy, expecting that they would produce astonishment in many Western countries.

"This is the first time that we have internationally comparable data on learning outcomes in China," Mr. Schleicher said. "While that's important, for me the real significance of these results is that they refute the commonly held hypothesis that China just produces rote learning."

"Large fractions of these students demonstrate their ability to extrapolate from what they know and apply their knowledge very creatively in novel situations," he said.

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PISA 2009 marks the beginning of the second cycle of surveys, with an assessment in mathematics scheduled for 2012 and one in science for 2015.