

# EDUCATION DAILY®

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## GLOBAL COMPETITIVENESS

### PISA: U.S. students make gains in math, science

But nation continues to rank near the middle of OECD peers

By Emily Ann Brown

While U.S. 15-year-olds made enough gains in science and math on the 2009 Program for International Student Assessment to beat their predecessors' scores, they failed to exceed the average international performance in those subjects as well as in reading, and continue to rank near the middle among industrialized countries, according to a new report.

*Highlights From PISA 2009: Performance of U.S. 15-Year-Old Students in Reading, Mathematics, and Science Literacy in an International Context*, released Tuesday, compares the academic performance of teenagers in the 34 nations that are members of the Organisation for Economic Co-operation and Development.

The data showed that, while America's students made gains in the subjects of science and math, there were no signs of progress in reading since the last assessment in that subject six years ago. Despite that, U.S. testing officials said the results are encouraging.

"You know that the needle doesn't move very far, very fast in education, so I think we have to have that note of realism when you look at the results," said Stuart Kerachsky, deputy commissioner of the National Center for Education Statistics, which administers the test in the U.S.

"We're moving in the right direction," he added, responding to *Education Daily*® in a conference call with reporters on Monday. "Countries weren't passing us — we were either catching up or passing other countries."

PISA is administered every three years and is designed to assess what students around the world know and can do as they near high school completion. It also aims to show how well students apply such knowledge in real-world contexts, officials explained.

According to an OECD study, PISA results

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## STEM EDUCATION

### Engineers empower parents, spark interest in STEM

By Tricia Offutt

Philosophically, most educators agree that American students should know more about science, technology, engineering, and math. But in reality, those subjects sometimes get short shrift in the classroom.

If left unchecked, this reality ultimately will mean a shortage of high-paying jobs here, less intellectual might, and an inability for Americans to solve future problems in the STEM fields, said Tara Chklovski, an aerospace engineer and founder of Iridescent, a nonprofit that provides family science programs and receives funding from the Office of Naval Research.

Chklovski and an army of engineers in Los Angeles and New York City are intent on shifting the focus on STEM from talk to actuality through hands-on, experiment-based, interactive family science programs that allow parents and children to learn complex scientific concepts together.

The group works in high-poverty schools to teach standards-based evening courses to children and families. Teachers are welcome, but not required to attend, and the group brings in its own curriculum and trained engineers to teach.

This after-hours approach enriches Title I schools where science instruction can become de-

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emphasized, especially during the early elementary grades as staff race to get students on grade level in the high-stakes AYP subjects of math and reading. “I think instead of blaming teachers, I want to figure out ways we can support them,” she said.

The approach also provides a way for Title I schools to enhance parent involvement. “We get the parents on board so they can see this is something their child can do,” Chklovski said.

Postsecondary partnerships with families — particularly when engineers are given adequate training — could quickly ignite and increase interest in STEM fields, she said. Iridescent is teaming with a growing network of K-12 and postsecondary schools to create what Chklovski hopes will be a winning combination of east-meets-west educational values.

The effort blends the tenacity to succeed and a respect for STEM careers found in Indian and Chinese schools with U.S. schools’ focus on interest-driven career choices, critical thinking, and inquiry-based learning.

**Troubling statistics**

U.S. students — especially girls, minorities, and those from high-poverty neighborhoods — misunderstand or don’t see science or engineering as valuable, attainable career choices.

“They think engineers are people who fix cars,” said Chklovski, a former principal of a K-6 school in India. Although U.S. students, regardless of ethnic background or socioeconomic status, are urged to follow their interests and passions, too few are challenged to take on STEM coursework.

Meanwhile, in India and China, despite what Americans often view as old-fashioned societal norms for women, there are far more women in those countries who enter science and engineering professions compared to American women who do so. Only 4 percent U.S. ninth-graders in 2001 are predicted to earn STEM-related degrees by 2011, accord-

ing to a September 2010 report by the President’s Council of Advisors on Science and Technology.

The report also noted that of the 30 percent of students who are proficient in science and math by eighth grade, 60 percent of those become disinterested in STEM fields during high school. Among those students who remain interested, only 40 percent major in a STEM field in college, and of those, 60 percent switch out to other studies, PCAST found.

In contrast, of the 80 girls in Chklovski’s high school graduating class in India, roughly 60 percent went into medicine and 40 percent into engineering. “In India, there’s no passion or exploration or soul [in career choice], but at least there is that drive,” she said.

STEM careers in India and China are seen as a way out of poverty, but here, those same careers are viewed as overly difficult or nerdy, Chklovski said.

American women traditionally are viewed as independent and capable, but there remains an insidious message that girls wear pink, love to shop, and STEM careers are messy and too tough for the feminine mind to grasp, Chklovski said.

In the U.S., about a third of bachelor’s degrees earned are in a STEM field, while in China that figure comes in at 53 percent, and in Japan it’s even higher at 63 percent, according to the PCAST report.

Since the late 1980s, the percentage of high school students who have taken at least one physics course by graduation has risen from 20 percent to 37 percent. “These results demonstrate that positive movement is possible, but progress has been slow and often slight, and it is not sufficient to get all U.S. students — regardless of where they live — to where they need to be,” the report warned.

Chklovski thinks that despite the grim, long-standing statistics on STEM and U.S. students, when engineers, families, and schools work together, they’ll create an irresistible glow about science that changes how parents and kids view their futures.



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