



Lawrence King, Editor

Special points of interest:

- More funding for CS requested
- Report on NAEP
- Boys/Girls STEM Gap

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# STEM NEWS

DEBLAR & Associates, Inc.

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## Latino Trailblazer

Richard Tapia was born in Los Angeles to parents who emigrated from Mexico when they were children, seeking educational opportunities. He was the first in his family to attend college, earning his B.A., M.A., and Ph.D. degrees in mathematics from the University of California, Los Angeles.



Currently, Tapia is a professor at Rice University. He holds the Maxfield-Oshman Professorship in Engineering and is a professor in the Department of Computational and Applied Mathematics at Rice University.

Due to his efforts, Rice University has received national recognition for its educational outreach programs, and the Rice Computational and Applied Mathematics Department has become a national leader in producing women and underrepresented minority Ph.D.'s in the mathematical sciences.

## Tim Cook, Mark Zuckerberg and others urge Congress to fund K-12 computer science education

The 'royalty' in tech joined by CEOs of Deere & Co, DuPont, American Airlines, Marriott Hotels, Disney, Morgan Stanley, BlackRock, Walmart, Target, etc. urge Computer Science education funding.

Some of the biggest names in tech and corporate America, including Facebook CEO Mark Zuckerberg, Apple CEO Tim Cook, Facebook COO Sheryl Sandberg and Walmart CEO Doug McMillon, have teamed up with governors and educators to ask Congress to provide \$250 million in federal funding to school districts in order to give every single K-12 student in the nation an opportunity to learn how to code. The breadth of support shows that computer science isn't just a tech problem anymore, it's an America problem according to Code.org founder Hadi Partovi.

### Why coding matters

"The good thing about computers is they develop so many different levels of children's thinking. Just in the coding alone, you're reading, you're writing, you're using spatial reasoning, you're using problem-solving, you're using creativity. So just in general it helps with metacognition." ....**Sabrina Knight – Brooklyn Public Schools Teacher**



## What makes a quality STEM program?

**DEBLAR & Associates** receives inquiries from readers and teachers asking this question as they seek to build support to better serve the educational needs of their students. There may be many answers depending on the particular situation, but these elements are most often what we recommend. First we ask these questions.

Is the program interdisciplinary and problem based, and does it encourage deeper learning through real-world projects?  
 Does the program demand authentic assessments?  
 Are students working the way scientists and engineers work?  
 Does your STEM program engage business, industry, and local colleges, as well as families and community organizations?  
 Does the school reach out to girls and minorities?  
 Does your school ensure that teachers and administrators become STEM learners so they are better able to lead STEM programs?

Then we suggest these elements to design into the program.

- Project learning exercises that are interactive
- Team based problem solving
- Strengthening communication skills
- Linking projects with Field trips

### Sobering NAEP Report

Among eighth-grade students in public and private schools, 45 percent of girls and 42 percent of boys scored proficient on the exam, the National Assessment of Educational Progress, or NAEP. Overall, 43 percent of all students were proficient.

The test was designed to measure students' abilities in areas such as understanding technological principles, designing solutions and communicating and collaborating. Girls were particularly strong in the latter. There also were large racial and socioeconomic achievement gaps, mirroring results on standardized tests in other subjects. Just 25 percent of students who received free and reduced-price lunch scored proficient, compared to 59 percent of more affluent students. Eighteen percent of black students and 28 percent of Latino students scored proficient, for example, compared to 56 percent of white and Asian students.

NAEP, also called the Nation's Report Card, is best known for providing information every two years about student performance in math and reading. The National Assessment of Educational Progress (NAEP) is the largest nationally representative and continuing assessment of what America's students know and can do in various subject areas.

In 2015, 34 percent of eighth-graders were proficient on the NAEP reading exam, and 33 percent were proficient in math.



### Engineering continues to lose undergraduates' mindshare

Engineering jobs often ups and downs. I recall my High School had the idea to have someone in the industry come to talk to us in my Sophomore year at Brooklyn Technical. He painted such a bleak employment picture for engineers in 1970 that I switched from Electrical Engineering to more of a College curriculum of 'General Engineering Technology'. Being 16 (and 10 years before the internet would have allowed me to do my own research) I didn't anticipate that by 1973 the prospects would change. As the man said, predictions are hard, especially about the future.

One reason I argue for talking and thinking about engineering as a pathway for developing one's intrinsic intellectual interests and orientations is that, whatever happens in the marketplace, you'll be using and developing your brain in a way that brings pleasure and growth. Finding work that allows this activity to continue might just be the secret to professional happiness. *(Danial Lark, NYS Office of Information Technology Services)*

## More on Grant sources

DEBLAR & Associates, Inc. have been successful in supporting K12 and higher Education grant applicants as external evaluator or providing specific technical program design. Here are three more education grant providers that non-profit groups or teachers may consider contacting.

### Saxena Family Foundation Grants

The Saxena Family Foundation has a particular focus on initiatives that promote US science, technology, engineering, and mathematics (STEM) education and the empowerment of girls, female children, and young women so that they have equal rights later in life. The foundation focuses on empowerment programs to include economic, educational, and political empowerment of women through literacy programs, jobs, and life-skills training. Previous grantees have included schools, universities, and nonprofit organizations. **Deadline: Rolling.**

### The Halliburton Foundation Education Grants

The Halliburton Foundation accepts grant proposals from U.S. based nonprofit organizations that serve the following areas: education, health, and health-related social services. Strong preference is given to organizations in areas where there is a significant presence of Halliburton employees and operations. Direct Grants are made to U.S.-based elementary and secondary schools and higher education institutions. Additionally, the foundation supports education at all levels through employee matching gifts and scholarships. **Deadline: Rolling.**

### RGK Foundation

The RGK Foundation awards grants in the broad areas of education, community, and health/medicine. The Foundation's primary interests within education include programs that focus on formal K-12 education (particularly mathematics, science and reading), teacher development, literacy, and higher education. **Deadline: Rolling.**

Making STEM Come Alive for Low-Income Students! See why Dr. Darryl Lee Baynes, President of the **Minority Aviation Education Association's** Interactive Science Programs, is fast becoming known for his talents in showing inner city kids, through engaging lab experiments, just how exciting science can be! Says Darryl: "I want to get kids thinking about science. That's what I try to do in these presentations." - [dbaynes@interactivescienceprograms.org](mailto:dbaynes@interactivescienceprograms.org)

## Years of programs, testing, standards, and accountability have not ended racial achievement gaps in science and math

Much of what some researchers report and that education administrators and parents buy into is the socio-economic conditions across America will continue to shape education outcomes. Some of our reader's comments on this issue.

*"I'm a volunteer science teacher who has helped teach science in hundreds of schools. Some were strong, and some were weak, but the strongest I've ever seen is over 90% Latino, is a public charter school in a low-income part of a major city, and has achieved outstanding results. The students in that school take double math, double English, have a strict discipline code, wear uniforms, and are openly college-prep in their focus."*

*"This is such old news. We all know the gap exists. Concentrating on closing the gap is futile. Concentrating on growing the skills of those students with major gaps in their background knowledge is the key. There will be haves and have nots. However, our national freedoms afford us the opportunity to, if we want it bad enough, and if we work doggedly and put our efforts forward, to advance beyond our current place in society. As long as there is talk about a gap, there will be one."*

*"High poverty schools teach students less than the teachers were taught. Social studies, art, field trips have been eliminated. The soft bigotry of low expectations are embraced in paternalistic intentions. Until teachers commit to teaching their students more than they were taught poor students will learn less."*

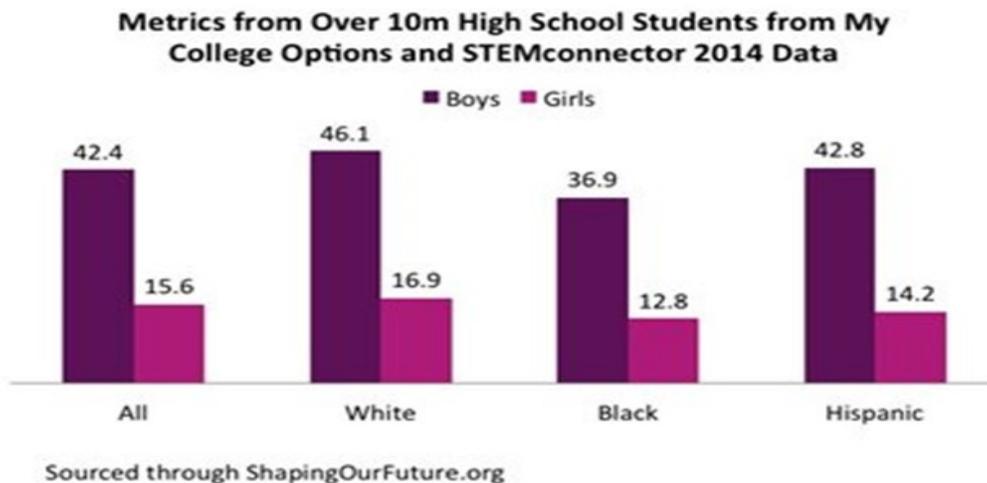
Marva Collins and her Westside Preparatory School in Chicago. In her own words, "Everything works when good teaching works," and race, socio-economic status, gender, don't matter."

## Boys, girls show wide gap in STEM interests

There is a vast gap between the number of high school boys and girls interested in STEM, and the type of careers that attract the different sexes, according to Julie Kantor, Chief Partnership Officer for STEMconnector and Million Women Mentors. Kantor found the gap by sifting through data from one STEMconnector's partners, My College Options.

The website helps high school students pick colleges based on their interests. Kantor was able to tap 13 years of data from paper surveys administered as well as a 100,000 student survey that tracked whether student interests changed between freshman and senior years.

### Interested in Pursuing STEM Careers



Perhaps the most interesting chart Kantor showed in her article compared the STEM interests of boys and girls. Boys gravitated to engineering and computer and information science, while girls favored biology. Engineering grads earn significantly more than biology grads.

The other source of worry is the high number of girls who pick "science" as an interest compared with boys (17 vs. 6 percent). This lack of specificity suggests that girls do not have enough information, for whatever reason, to choose a specific discipline.

### Missing strong science and math practices

I have written several papers during my Masters program twelve years ago dealing with STEM and project based-learning in classrooms. During that time nearly all of the primary resources for study came from Canada, Japan, basically outside the US. In the past 5-6 years there was a boom of STEAM and STEM that has since changed that. Now if we go back to 12 years ago knowing this, I suspect teachers in elementary were not able to access the research and had limited training during college and/or later with PD. Lots of programs in the elementary limited the time spent on science to increase the time spent on math, reading, writing. Times are changing and now schools need help accessing the training for teachers. So, obstacles abound now. Administrators are limited in funds and staff and the students who are born to learn through PBL are asked to sit instead of solve by hands-on learning.

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**MORE ON GRADUATION RATES**

**Volume 5, Issue 1** of STEM News featured our Editor’s blog on graduation rates. Here is more to help frame the issue.

Nationally, Hispanic/Latino and African American students are starting to close the graduation gap with their White peers. This tells us that those who have historically been viewed as underserved can make tremendous progress when given the right resources and time.

Seven states – Michigan, New York, Ohio, Georgia, Florida, California and Illinois – educate about 40 percent of the nation’s African American students. All of these states either have graduation rates in the 60s for African American students, or have recently experienced significant declines.

Unless these states start to experience significant improvements, the recent progress made in raising African American graduation rates will stall.

**“FRESH APPROACH TO PROFESSIONAL CONSULTING”**

*“There is a STEM component to almost every job today. We need to create broader pipeline of work ready and skilled workers to fill jobs today and in the future.”*  
**John Whitaker, Lockheed Martin**

**Women of Color STEM Conference is accepting nominations for the following categories:**

- Leadership Award:** A student who is currently a member of a STEM organization on or off campus in a leadership position.
- Research Award:** A student that has received recognition for a research project in which they have been a participant.
- Academic Award:** Serves to recognize a student who has upheld the principals of scholarship and are impacting the academic atmosphere of their campus in a positive way.

Application Link: <https://www.surveymonkey.com/r/2016WOCStudentLeadership>

**TOP IT FUTURE JOBS**

