



Lawrence King, Editor

Special points of interest:

- STEMfest, Canada
• Camp Invention
• Equal Futures Project
• Broadening Participation
• Engineers Week Feb. 22 to 28, 2015

In this issue:

Research Frontier 2
Suggestions at GSTA Annual Conference 2
Dow Chemical Action 3
Intel Invests 5

STEM NEWS

DEBLAR & Associates, Inc.

Page 1

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Education Workforce Diversity Challenge

This is my perspective on the issue of STEM equity gaps for vulnerable student populations through the lens of educator availability and effectiveness.

Specifically, it appears we are challenged by three factors: 1) lack of recruiting and distributing enough effective educators of diverse cultures, ethnicities, and gender, 2) insufficient support and not retaining teachers through targeted incentives and professional development, and 3) unavailability of effective educator evaluation practices to address teacher performance and student equity gaps for vulnerable student populations.

With increasingly diverse student populations, educational equity is a continually growing challenge for public schools across the United States. The challenge is as prominent for those at the front of the classroom. Too many underrepresented K12 students fail to have a teacher they can easily identify with and who looks like them.

While federal government, states, and school districts work to identify and address the root causes of equity gaps in the educator workforce as well as K12 teachers being majority female, efforts have often been hampered by a limited body of research based strategies and approaches that offer solutions.

Teachers who are highly qualified must be certified or licensed, hold a bachelors degree, and have demonstrated competencies in their teaching area. If more of them were identifiable with the students in front to them in appearance and life experience, we may begin to see positive change in student learning outcomes.

Lawrence King

How we are Connected

Global STEM States Incorporated is a not for profit association, incorporated in Australia, which aims to act as a forum through which industry, associations, academia and government can come together to discuss Science, Technology, Engineering and Mathematics (STEM) education and innovation, and the role it plays in the needs of industry, export, trade and development.

DEBLAR & Associates is proud to be part of the Global STEM States network. "the 2nd International Festival of Science, Technology, Engineering, and Math (STEMfest) will be held in Saskatoon, Canada September 27th thru October 3rd, 2015. Abstracts may be submitted by visiting the link below.

http://stemstates.org/stemfest-2015/submit-a-paper-issn-2203-241x.html

Conference Theme: "Skillling a Nations Future, Aligning STEM Education to a States future Human Resource Needs"

For additional details, contact Scott Campbell, scampbell@globalidn.com

Lawrence King - STEM Ambassador, Global States STEM, http://stemstates.org/

## King's Presentation at Georgia Science Teachers Conference, February 6, 2015

At the Annual Conference in Macon, King presented on the topic, **“Approaches to attract under-represented students into STEM”**. The presentation was not about underachievement, instead King focused on a set of modest solutions to restore our leadership in science, technology, and the economic growth that can result. Educators from across Georgia participated in two days of presentations and meetings concerning achievements and challenges teachers experience in the classroom and addressing administrative issues.

Listening to teachers and administrators on the matter of rural education challenges and how they differ from urban school settings STEM instruction, King offered three suggestions for Georgia's ten poorest rural county school districts that one in four of all students attend.

1. Incentives for science and math teachers in these counties that are creative and effective in designing interventions in and out of the classroom that attract more students but particularly under-represented minorities and girls into STEM education and careers,
2. A bootstrap fund for under-resourced urban and rural school districts for facilities and infrastructure science and math teachers will require to fulfill their task of education, and
3. A fund to defray up to 50% of student loans for twenty (100) science or math teacher making a commitment to teach in one of Georgia's schools outside metro Atlanta for not less than three years.

Created by the National Inventors Hall of Fame, **Camp Invention** is the only nationally recognized summer program focused on creativity, innovation, real-world problem solving and the spirit of invention. We partner with the United States Patent and Trademark Office and the Collegiate Inventors Competition, and everything we do is inspired by the world's smartest inventors.

At Camp Invention, our top priority is to provide quality programming in the fields of science, technology, engineering and mathematics. So our unrivaled program presents essential STEM concepts through the most creative hands-on activities. By combining learning and fun, we satisfy parents, educators and children, earning an approval rating of more than 90%.

Larry, It was lovely to see you at the GSTA conference last week. I am enjoying your newsletters because they assist me in my own professional development and knowledge-base regarding STEM. Thank you so much for your willingness to share!

**Kimberly V. Moore**  
**Regional Program Development Manager**

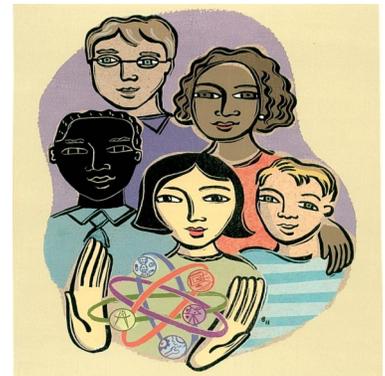
[www.invent.org](http://www.invent.org)    [www.inventionproject.org](http://www.inventionproject.org)

## STEM Education Research Frontier

Innovation in science, technology, engineering and mathematics (STEM) play an essential role in creating new economies, increasing competition in the global market, and improving the quality of life. Given the importance of STEM in our lives, nation's economies and the environment we live in, there has been an increasing emphasis on teaching STEM under the umbrella of STEM in recent years. STEM stands for the blended and problem-based learning environment that integrates all four subjects in an interdisciplinary fashion.

While the idea of STEM is relatively new, STEM programs are flourishing in schools in every corner of the world. The rapid adoption of the STEM idea calls for new understandings about how to reframe the curriculum?, how do teachers develop knowledge/expertise to implement the interdisciplinary curriculum?, and how do students most effectively learn in a blended and interdisciplinary learning environment?. The adoption and implementation of STEM programs also bring new responsibilities for STEM education research community.

We should develop new research approaches to understand student learning and teacher practice in these new contexts. We should also establish new interdisciplinary communities to discuss issues and opportunities associated with adoption and implementation of STEM education programs.



## Understand why Diversity is critical in Tech

“If you believe diversity to be a luxury, or something ancillary to your company/ organization's mission, you will miss the larger point.

Diversity is critical to ensure technological innovations that solve real problems. The sector has already lost enormous amounts of talent by ignoring entire sectors of the population as potential innovators. The demographic shift in this country will render many tech companies irrelevant as they are unable to meet the needs of users.”

**Nicole Sanchez, CEO of Vaya Consulting**

The **Dow Chemical Company** (Dow) and the American Association of Chemistry Teachers (AACT) are partnering to invigorate chemistry education and support STEM (science, technology, engineering and math) education in the nation's schools.

Dow and AACT will work together to convene a series of teacher summits and create more than 750 lesson plans, multimedia resources, demonstrations and other high-quality chemistry teaching materials for use in K–12 classrooms. The work will be supported by a \$1 million contribution from Dow to AACT spread over a four year period.

AACT is the first national organization of its kind in the United States. Membership in the new organization is open to all who are interested in chemistry education. AACT has three goals: to serve as a trusted source of curricular and pedagogical resources for K–12 chemistry instruction, to provide opportunities for chemistry teachers to network with each other and the broader ACS community, and to disseminate effective teaching and learning practices at the K–12 level. For more information, visit [www.teachchemistry.org](http://www.teachchemistry.org).

The American Chemical Society is a nonprofit organization chartered by the U.S. Congress. With more than 161,000 members, ACS is the world's largest scientific society and a global leader in providing access to chemistry-related research through its multiple databases, peer-reviewed journals and scientific conferences. Its main offices are in Washington, D.C., and Columbus, Ohio. For more information, visit [www.acs.org](http://www.acs.org)

## Broadening Participation in STEM

### Equal Futures Partnership

The Equal Futures Partnership aims to open more doors to high-quality education and high-paying career opportunities for women and girls in science, technology, engineering, and math (STEM) disciplines—fields in which they are currently underrepresented. To support this effort, Federal science and technology agencies, private corporations, and academic institutions are taking steps to collect better data on women and girls in STEM fields, expand STEM mentoring opportunities, encourage research-driven teaching practices, and increase access to online STEM-skill training.

The accomplishments of agencies in two initiative areas within Equal Future Partners by the Obama administration that directly relates to STEM are:

**Opening Doors to Quality Education and High-Paying Career Opportunities in Science, Technology, Engineering, and Math:** Federal agencies and private partners have made great progress on connecting young women to high-quality science, technology, engineering, and math (STEM)-related resources. In just seven months, over 20,000 students interacted with 500 women mentors via Harvey Mudd and Piazza's online platform **WitsOn**, while the National Science Foundation, Office of Personnel Management, and non-profit partners joined forces to train Federal scientists and engineers on serving as a resource for girls interested in STEM.

**Promoting Civic Education and Public Leadership for Girls:** The Obama Administration has advanced new efforts to promote girls' leadership and civic education, including sponsoring an "app challenge," hosting a conference on girls' leadership and civic education at the White House with the Department of Education and the Rutgers Center for American Women and Politics (CAWP), and advising on the development of a new initiative, Teach a Girl to Lead (TAG) – featuring online resources and a national speakers' bureau.

## Vital Signs for Engineers Week, February 22 – 28, 2015.

- between 2014 and 2024, the number of STEM jobs will grow **17 percent**, as compared to **12 percent** for non-STEM jobs;
- engineering and advanced manufacturing workers are much more likely than non-STEM workers to be within 20 years of retiring;
- African Americans and Latinos are less likely to pursue careers in engineering, computer science, or advanced manufacturing than they were in 2001; and women remain as scarce as ever in engineering, computing, and advanced manufacturing.

The best way to solve STEM's diversity dilemma is through investments in high-quality STEM programs that are addressing the issues of access and opportunity for girls and young people of color. **DEBLAR & Associates** has been committed to working in partnership with K12 schools, universities, and corporations to address this vital economic and national security concern.

Lawrence King led student groups at Floyd Middle School in Mableton Georgia through classes on general engineering and chemistry under the guidance of Connection Engineering and Technology teacher **Dr. Mary Mwangi**. King conducted student interaction tracks focusing on Chemistry and General Engineering along with exercises and videos.



In our work with universities focusing on increasing minority student engagement in scientific and technical research, we believe colleges and K12 schools should continue to employ more interdisciplinary models of education, including undergraduate research opportunities, which attract under-represented students to STEM instead of pushing them through weed-out introductory courses. We need sustained actions to broaden the pipeline of STEM talent by ensuring that every high school student is able to fully pursue his or her interests in STEM fields and having an early introduction to research opportunities.

To do so, we must raise standards for all students, improve teacher education, offer more hands-on learning opportunities, and better expose junior and senior HS students to basic and applied research as career alternatives.



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**“FRESH APPROACH TO  
PROFESSIONAL CONSULTING”**

[Engineering Outreach on Campus](#) analyzes survey results from over 100 engineering outreach programs run by colleges and universities. The first paper from this project is out and available for download at: [www.start-engineering/start-engineering-now](http://www.start-engineering/start-engineering-now).

The report looks at the reasons people cite for running their outreach programs and the audiences they reach. Results show big numbers of participants and a strong focus on diversity. Upcoming releases from the project will examine the types of events programs offer and approaches to administration, including budget, staffing, and assessment. Comments and questions are welcome.

Contact Eric Iversen, VP for Learning and Communications at Start Engineering, [eiversen@start-engineering.com](mailto:eiversen@start-engineering.com)

Observed in the late 70s, that the significant change in engineering workforce diversity was the result of surprising increases in women enrollment in engineering colleges. Now a new dynamic is occurring. Women are leaving tech career field in droves.

An already dire shortage of qualified tech workers will grow worse if women continue to leave the field. Women in tech say filling the pipeline of talent won't do much good if women keep quitting. Last summer, Google, Facebook, Apple and other big tech companies released figures showing that men outnumbered women 4 to 1 or more in their technical sectors. It's why the industry is so eager to hire women and minorities. For decades tech companies have relied on a workforce of whites and Asians, most of them men.

*“A sound K-12 STEM education preparation for a child of any race provides evidence that he or she can master mathematics and science by “practice” and “discipline” and to be able to use their knowledge to not only question what we think we know about our world and universe, but to establish improved understanding of one another.”*

**Lawrence King**



## Intel Investing in STEM

Silicon Valley has always looked for talent among the young. It's only recently, though, that it has set its sights on grade school. Silicon Valley isn't trying to hire preteens (*yet*), but some of the country's mightiest tech giants are aiming to bolster the talent pipeline by putting serious money behind kids' math and science education, particularly for girls and minorities.

At the Consumer Electronics Show in Las Vegas in early January, Intel CEO Brian Krzanich announced that he will dedicate \$300 million to sponsor STEM education in K-12 classes and in universities, with a focus on underserved regions.

The money is part of a broader effort to boost diversity among its workforce and will also fund recruiting, training, and investments in female and minority-owned startups, along with education.