Issue 2

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Can the 85,000 H1B Visa applicants admitted annually be gradually reduced by 10% by increasing the number of minority scientists and engineers graduated from US colleges and universities?

How would it impact our global competitiveness?

Lawrence P King

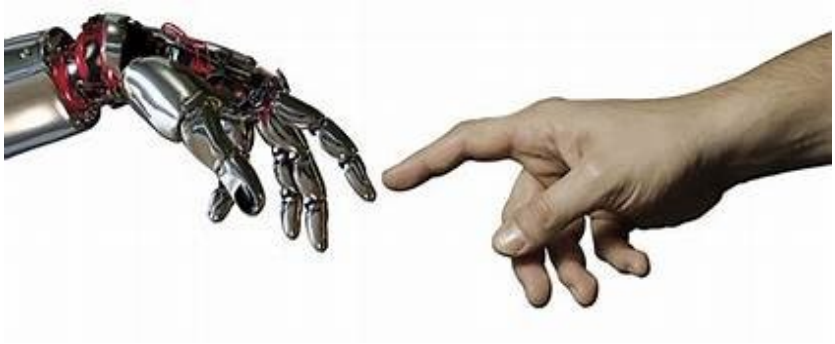
Publisher

STEM NEWS CHRONICLE

Questions for our readers

How can minority students plan for a career in artificial intelligence or, as machines demonstrate intelligent behavior, will they eliminate or create jobs?

Looking ahead, we would like to receive thoughts on either of these topics so we can share what our community of educators and technologists think on the topics.



Please limit comments to about 300 words. If a picture would illustrate your viewpoint please include it. We would like to include some of what we receive in our next quarterly issue.

We also remain keenly interested in hearing from readers on those associated science and engineering education issues that directly relate to our nations capability for innovation, critical thinking, and creativity as it relates to the growing minority population in our school systems.

Look for an upcoming issue that will feature developments in polymer science opening new careers.

Lawrence King

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Are universities doing enough to close racial gaps in critical STEM fields?

Students of color studying science, technology, engineering and math are underrepresented at schools around the country and even though most don't face overt racism as being reported recently, they face a set of challenges that have led to persistent issues of under-representation at the graduate levels and across STEM professions.

African-American and Latino workers comprise just 16 percent of the advanced manufacturing workforce, 15 percent of the computing workforce and 12 percent of the engineering workforce, rates that have remained essentially flat for more than a decade, according to the **U.S. News/Raytheon STEM Index.**

Encouraging Blacks and Latinos, both growing populations, to pursue STEM careers is not limited to an equity issue for our science/engineering workforce. It is crucial for the economy, as we have stated in earlier articles of the newsletter. Despite a national focus on directing more students toward science, technology, engineering and math fields – particularly women and minorities – the science/engineering workforce is no more diverse now than in 2001, according to data from **Change the Equation.** Nationwide, our science/engineering workforce is aging. About half of the workforce in engineering and advanced manufacturing is approaching retirement, and the growth in the percentage of young workers is not keeping pace with demand.

Reader Feedback

"Awesome edition of the magazine!"

Dr. Marvin D. Carr, Sr. Advisor, Office of the Director, Institute of Museum and Library Services

"*Thanks for sharing this helpful information. Looking forward to future issues".*

Kalonda Colson McDonald, MakerMinded, State Coordinator, Detroit Math Science Center Director

Highlighting NASA STEM Program at York College

Since 1999, this program has served over 20,000 students and many are in graduate schools or graduated with STEM degrees. Former participants happily reflect on their STEM learning experience provided by NASA STEM called SEMAA (Science, Engineering, Mathematics and Aerospace Academy) and MAA (MUREP Aerospace Academy; now replaced SEMAA). It is true that number of students entering in STEM field from this group is not remarkable, yet if we do nothing and meekly submit to the present-day reality, we will be missing out on a very critical and strategic goal to generate STEM pool for both present and future needs.

We also believe that traditional classroom teaching in K4-10 apparently lacks a great deal of ELO due to time- and - resource constraints and STEM program like MAA can significantly enhance and improve students STEM learning including physics by allowing students opportunities to enroll after school or Saturday STEM Program lasting 4 hours/week. Students generally do better in a situation where they find themselves to value a "sense of belonging" and importance of "STEM learning." They also greatly benefit from being part of a team and the strength of the group dynamics. I would rather describe students involvement in NASA STEM Program as curious learners working with complete spontaneity and helping each other to reach a new dimension of success.

Nazrul I. Khandaker, Ph.D., P.G. Professor and Discipline Coordinator of Geology, CUNY

Scientist at the Frontier of Nanotube Science

Dr. Baratunde Cola is currently focused on understanding and designing thermal transport and energy conversion in nanostructures and devices – particularly those based on carbon nanotubes or polymers. His group develops tools to characterize thermal transport across several orders of scale for this purpose. His research interests also include scalable fabrication of organic and organic-inorganic hybrid nanostructures for novel technological use. These technologies include thermal interface materials, thermo-electrochemical cells, optical rectenna, carbon nanotube metal composites, and materials that can be tuned to regulate the flow of heat.

Dr. Cola's research involves theoretical and experimental components, and he seeks to solve problems with high importance to applications in clean energy (e.g., direct conversion) and the efficient utilization of energy (e.g., more efficient thermal management), and in major industrial segments such as consumer electronics.

“I went to college to do engineering and play football, but I always knew I wanted to be an entrepreneur. I was introduced to nanotechnology as an undergrad and it blew me away. I wanted to become an expert in nanotechnology because I thought there would be really great opportunities for people who really understood the technology but also had the business fire and acumen to go out and do something in the marketplace. When I started my PhD studies at Purdue University I started working on what was the superstar of nanomaterials, the carbon nanotube.”

The carbon nanotube was this new form of carbon discovered in 1991 and it was like the Superman of nanomaterials. It’s 10 times stronger than steel and 10 times smaller volume. It’s the best conductor of heat, best conductor of electricity and so I wanted to do something with it that combined my background as a mechanical engineer with interest and expertise in heat transfer and nanotechnology.”

Career Choices

Biomedical engineers combine engineering principles with medical and biological sciences to design and create equipment, devices, computer systems, and software used in healthcare.

Biomedical engineers typically do the following:

Design biomedical equipment and devices, such as artificial internal organs, replacements for body parts, and machines for diagnosing medical problems

Evaluate the safety, efficiency, and effectiveness of biomedical equipment

Train clinicians and other personnel on the proper use of biomedical equipment

Research the engineering aspects of the biological systems of humans and animals with life scientists, chemists, and medical scientists

Biomedical engineers design electrical circuits, software to run medical equipment, or computer simulations to test new drug therapies. In addition, they design and build artificial body parts, such as hip and knee joints. In some cases, they develop the materials needed to make the replacement body parts. They also design rehabilitative exercise equipment.

Will Immigrants Rule Science?

I have two reactions to this question. First, as an engineer who understands and values the importance science/technology has on our economic health so I am supportive of having the best and brightest in our STEM workforce.

Secondly, as an African American I know and believe that the primary reason we have a paucity of native born minorities in our technical workforce is the result of years of severe science education under-funding and the institutional and systemic racism across the education and corporate landscape. This has created our dependency on India, Pakistan, China, and Japan to lead scientific and technical advancement in far too many industry segments.

We can begin to address national security and meet the workforce demands for engineers and scientists just by doubling the numbers of black and brown students who successfully move through the gauntlets of our education system and into employment as scientists and engineers for businesses dependent on technology. If we can do that, we can lose our dependence on skilled immigrant technologists to buttress our STEM workforce to the degree we have been.

Lawrence King

Bringing the Fan's Game Experience Closer

Gary Smith, Field Service Engineer with Daktronics is on the team supervising the installation of the world's largest Halo Display at the Mercedes-Benz Stadium in Atlanta.

His responsibilities consist of coordinating with all sub-contractors and electricians and serving as liaison on-site during the installation. Gary received his degree in computer engineering technology in 2006 from Southern Polytechnic State University (now Kennesaw State University).

This newsletter gives contributors as advocates for minorities, a platform to present perspectives on solutions for science and engineering advancement, on the question of "what works". Alternative viewpoints expand the question by asking, for whom, where, and when? Let us hear from you on solutions with merit?