

The Virginian-Pilot

Opinion: America needs a new strategy to advance STEM education



John C. Clark for the *Daily Press*

Aeronautics Engineer Heather Kline PhD. shows students an aeronautical map of the Hampton Roads area of Virginia at Jones Magnet Middle School on Feb. 3, 2020. Kline explained the difference between “true north” and “magnetic north” to the students. (John C. Clark for the *Daily Press*)

By JOANN P. DIGENNARO

November 14, 2023 at 6:05 p.m.

America’s ability to compete globally depends in large part on the quality of our education system. Science, technology, engineering and mathematics (STEM) education, in particular, forms the bedrock our nation needs to advance economically and technologically.

Unfortunately, American students lag behind those in many other nations when it comes to math and science proficiency. According to a 2018 White House report, only 20% of high school graduates are prepared for college-level coursework in STEM majors. As shown by the National Assessment of Educational Progress (known as the Nation’s Report Card), the pandemic has only increased these challenges.

Faced with these growing problems, the U.S. cannot accept this decline as inevitable or lower our academic standards. Such an approach does a great disservice to our teachers, students, parents and the nation overall.

We can do better, but America needs a proactive approach to address these issues and improve STEM education. Everyone involved — Congress, the administration, schools and nonprofits — has an integral role to play.

In the coming months, the White House is expected to release its new five-year federal STEM strategic plan. Mandated by the America COMPETES Reauthorization Act of 2010, this updated plan is designed to provide a roadmap for improving STEM education.

As the president and founder of the Center for Excellence in Education with Adm. H.G. Rickover, I was pleased to provide comments and suggestions to help guide this strategy. I believe that CEE's success over the years provides a unique perspective on how to enhance our nation's STEM education.

Founded in 1983, the center's mission is to "nurture high school and university scholars to careers of excellence and leadership in science, technology, engineering and mathematics (STEM) and encourage collaboration between and among scientific and technological leaders in the global community."

Over the past 40 years, CEE has enriched the educational experience for hundreds of thousands of STEM students throughout the United States. CEE sponsors four flagship programs — the Research Science Institute (in partnership with the Massachusetts Institute of Technology), the USA Biolympiad, the Teacher Enrichment Program, and Student Lyceums. Provided at no cost to the participating students and educators, these programs recognize the accomplishments of high-achieving scholars and expand access to resources for schools and students in underserved rural and urban areas.

As this nation works toward an improved and more inclusive STEM education system, we must avoid the efforts by some to water down gifted education programs or compromise the integrity of coursework. The appropriate response to this challenge is to strive for a system that provides an opportunity for excellence for all students. We can achieve this goal while also promoting inclusion for a diverse student population.

To achieve excellence, we should acknowledge the reality that students in the same grade often find themselves in different places academically. In such situations, differentiated teaching is key to enhanced learning. This allows for students to meet where they are in their academic journey and work toward building up their knowledge and skills. If we use this model, each student has a much better chance of reaching his or her potential.

I believe it is also necessary to counter a disappointing trend toward moving away from an objective, evidence-based STEM education system. Part of this new approach eliminates or de-emphasizes standardized testing in STEM subjects. We need objective measurements to see which students need additional help and how we can improve overall. Simply making everything more subjective does not address the underlying problems.

To thrive, America must produce and maintain a robust and forward-looking STEM education system. This requires sufficient funding at all levels. Simply adding money will not solve all the problems, but adequate resources along with the proper strategies makes success more likely. With a coordinated effort, our nation's students can receive the high-quality STEM education they deserve.

Joann P. DiGennaro is president of the Center for Excellence in Education, a 501(c)(3) charitable nonprofit based in McLean that nurtures careers of excellence and leadership in STEM for academically talented high school and college students.