

Opinion: Improve public schools with a focus on STEM education

By Joann P. DiGennaro
Guest Columnist
Mar 04, 2023 at 6:05 pm



Erion Johnson, right, and Jeremiah Blount cut plastic wrap to add to their solar oven, a STEM project for sixth-graders at Horizons Hampton Roads summer camp hosted by Chesapeake Bay Academy, on July 20, 2022. (Stephen M. Katz/*The Virginian-Pilot*)



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The United States thinks of itself as a great nation, and indeed it is. However, its status is threatened by infighting and complacency.

Greatness can never be sustained with platitudes and certainly not with divisiveness, but must be demonstrated in achievements — intellectual, ethical, economic, cultural and technological. Our ability to compete and excel in these areas is based on the skills and ingenuity of our citizens, and STEM is the bedrock on which all these areas of achievement rest. Excellence in STEM in turn rests on the quality of our education system. How does the U.S. reverse the decline of science and technology of education, the bedrock of economic global leadership?

The most recent year of the Trends in Mathematics and Science Study, U.S. fourth and eighth graders are only about average worldwide in mathematics, behind Great Britain, Ireland, Australia and Russia. U.S. eighth graders are thoroughly average, and worse yet, have made no measurable progress since 2015 or 1995.

The National Assessment of Educational Progress (NAEP), also known as the Nation’s Report Card, indicates that the state of U.S. education has only gotten worse since the start of the pandemic. Miguel Cardona, the U.S. secretary of Education, describes the NAEP results as “appalling” and “unacceptable.” It is difficult to disagree with him.

U.S. education is doomed to mediocrity if it stays on its present course. The most egregiously counterproductive trends are the use of mathematics and science as battlegrounds for culture wars; the anti-science, anti-evidence and anti-intellectual movement; and a hostility to standardized testing.

Devising effective curricula for mathematics and science is challenging enough without trying to clumsily force math and science lessons to conform to sparring ideologies. The last thing STEM classrooms need is to get entangled in hot-button issues.

The anti-intellectual movement damages math and science education in many ways. Children who have learned to become suspicious of science are not likely to apply themselves to the study of science in school or aspire to become scientists. This weakens the homegrown STEM workforce and creates a generation of people for whom scientific illiteracy is, perversely, a badge of honor.

Improving education will always present challenges, but if the ability to measure improvement in education through standardized testing is removed, it becomes literally impossible. No test is infallible, but when tests are replaced with subjective criteria, information is lost and biases run rampant, which is always most damaging to marginalized populations. During the height of the pandemic, many schools stopped standardized testing, refusing to gather desperately needed

information they knew would be bad. This continues to be a categorical abdication of responsibility.

Is it too much to ask that objective and evidence-based subjects be taught in an objective and evidence-based fashion? Is it too much to ask that with our children's future and the future of our country at stake that we set aside politics, figure out what works best in science and math education, and actually do it?

It is long past time to stop treating education like a political football; a distasteful task to be disposed of as expediently as possible; or an optional and marginally unpopular entitlement program. Education, and STEM education in particular, is the foundation of U.S. strength economically and geopolitically, but it could be identified by historians as one of the primary causes of the fall of this nation.

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. The center sponsors the Research Science Institute, USA Biolympiad, Teacher Enrichment Program and STEM Lyceums.