

PHILANTHROPY & PUBLIC EDUCATION Accelerating STEM Education

IN OUR OPINION

Improving STEM (Science, Technology, Engineering & Math) education in Florida demands a systemic approach, addressing the continuum from teacher training and preparation, to classroom resources and curricula, to assessment and evaluation. We must focus on approaches that are grounded in research and change how and what teachers teach, making STEM a robust component of a balanced curriculum that results in students who can compete in a global, 21st-century economy.

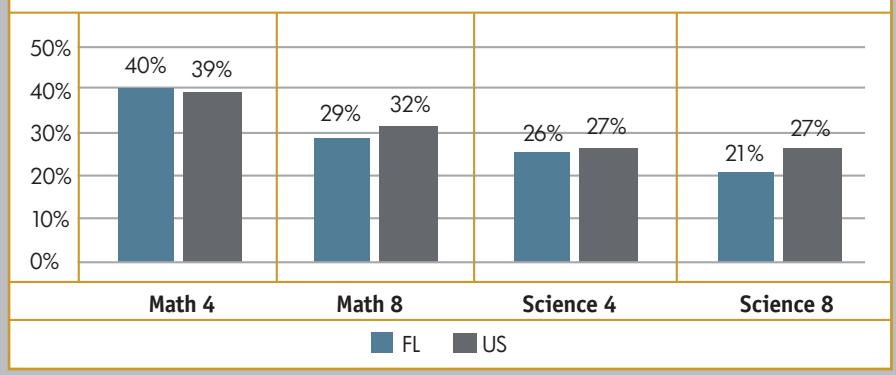
From Washington, D.C., to Monroe County, Florida, there is increased emphasis on student education in science, technology, engineering and math — STEM. Producing and maintaining a 21st-century workforce with high-caliber STEM skills is seen as essential to economic prosperity, both for individuals, the state and the nation.

“Because other nations have, and probably will continue to have, the competitive advantage of a low wage structure, the United States must compete by optimizing its knowledge-based resources, particularly in science and technology, and by sustaining the most fertile environment for new and revitalized industries and the well-paying jobs they bring,” according to a report by a consortium of national academies.⁽¹⁾

Unfortunately, the United States ranks low among its world peers in STEM proficiency among students. The United States ranks below average in science and math performance of 15-year-olds, according to the Organisation for Economic Cooperation and Development (OECD), well behind Canada, Korea, Germany, the United Kingdom and Poland. The performance of students in Florida, tested at the 4th and 8th grade levels by the National Assessment of Education Progress (NAEP), does not significantly surpass U.S. norms.⁽²⁾

Not surprisingly, Florida ranks low — in the bottom quartile — in terms of the proportion of its workforce employed in science and engineering jobs.⁽³⁾ In response, a host of Florida entities have called for or instituted new strategies to improve STEM education.

PERCENT OF STUDENTS
DEMONSTRATING PROFICIENCY
NATIONAL ASSESSMENT OF EDUCATION PROGRESS



RESPONSE FROM THE STATE AND THE PRIVATE SECTOR

In the last five years, the state of Florida has taken steps to ramp up the quality of STEM education.

In 2007, the state established the Florida Center for Research in Science, Technology, Engineering and Math (FCR-STEM) at Florida State University. Its mission is to improve K-12 STEM teaching and learning. Much of the Center’s work to date has been in research, with five research projects currently under way designed to inform district- and state-level policy on curricula, professional development and use of technology in the classroom. In addition, FCR-STEM conducts professional development sessions for teachers across the state, with roughly 1,500 teachers

participating in 2009-2010.⁽⁴⁾

In its 2010 session, the Florida Legislature passed legislation that changes the high-school graduation requirements in science and math and institutes new end-of-course assessments in the subjects that will replace the existing Florida Comprehensive Assessment Test (FCAT) in high school math and science. By 2013-14, students will be required to take Algebra I, Geometry and Algebra II, and Biology, Chemistry or Physics, and another equally rigorous science course.⁽⁵⁾

Florida’s application for Race To The Top, the competitive grant program of the U.S. Department of Education, includes plans to enhance STEM education with the funds that were awarded to the state in August 2010. Florida will hire 20 STEM

coordinators who will be "strategically assigned" to persistently low-performing schools. The state will create a competitive program for rural district consortia to build and implement model high school STEM programs for gifted and talented students.⁽⁶⁾

Private sector organizations, including the Florida Chamber of Commerce, Workforce Florida, the Consortium of Florida Education Foundations and others, have turned their attention to STEM as well, establishing STEMFlorida, an initiative to connect business, economic development and workforce leaders with education to increase emphasis on STEM.

In summer 2010, STEMFlorida held its first convening, bringing together more than 200 stakeholders — business, education and community leaders — to learn about the challenges facing the state and strategies to address those challenges.

A HOLISTIC APPROACH

While the engagement of scores of stakeholders from multiple disciplines is encouraging, it also creates challenges for change at the community level. To be optimally effective, changes in education should embrace the full spectrum of the education continuum, from teacher preparation and professional support, to materials and curricula, classroom practices, and assessment and evaluation of students and teachers.

In Southwest Florida, a five-year, \$2.5 million initiative of the Gulf Coast

Community Foundation of Venice involving schools in Charlotte and Sarasota counties hopes to achieve that holistic approach to change.⁽⁷⁾

The initiative begins with teacher preparation — helping teachers prepare themselves to meet the Next Generation Sunshine State Learning Standards. The work also involves helping school districts develop plans for ongoing teacher training and coaching.

Enhancement programs will encourage students to enroll in challenging math and science courses. And the initiative will connect community-based organizations and businesses with schools to provide enrichment opportunities and workforce mentors.

The initiative also will work to build the community's understanding — and parents' understanding — of the importance of high-quality STEM programs, and of encouraging young people to pursue higher education and careers in STEM.

Such an approach helps to build a critical mass of stakeholders, addresses the broad continuum of the educational process and instills in the community a sense of value that is likely to result in more lasting change.

ENDNOTES

- 1) National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, 2007.
- 2) National Assessment of Educational Progress most recent test results.
- 3) Florida Center for Research in Science, Technology, Engineering and Math, *A Snapshot: The State of STEM in Florida*, January 2010.
- 4) Florida Center for Research in Science, Technology, Engineering and Math.
- 5) Florida Tribune, 2010 Legislative Session Special Report.
- 6) Erik Robelen, "STEM Education to Get Boost from Race to Top Winners", Education Week, Aug. 25, 2010.
- 7) Gulf Coast Community Foundation of Venice press release.

WHAT IS "STEM"?

"STEM" initiatives involve more than teaching science, technology, engineering and math (STEM). A good initiative uses a true interdisciplinary approach that goes beyond the basics of science and math. Engineering is the application of science and math to design systems and processes to solve problems. The study of technology gives students the opportunity to better understand the three other subjects, providing a platform to apply what they have learned.

FLORIDA PHILANTHROPIC NETWORK & THE EDUCATION FUNDERS AFFINITY GROUP

Florida Philanthropic Network is a statewide association of grantmakers working to build philanthropy to build a better Florida. FPN's members are private independent, corporate and family foundations, community foundations, public charity grantmakers and corporate giving programs — from Miami to Jacksonville, Naples to Pensacola — who hold more than \$6 billion in assets (excluding members located outside Florida) and invest more than \$420 million annually to improve the quality of life for our citizens. FPN's members share a commitment to promoting philanthropy, fostering collaboration and advancing public policy *by Floridians for Floridians*.

Through the years, FPN members have expressed concern about the state of public education in Florida, noting the state's consistently low rankings on various measures and the challenges of providing adequate public funding. In 2009, a group of FPN members joined together to create the informal Education Funders Affinity Group, with the goal of building stronger partnerships with government around education policy in Florida.

These reports are intended as a tool to build the foundation for productive collaborations between state policymakers and education funders going forward. The viewpoints represented in this Issue Brief do not necessarily represent the viewpoints of any individual FPN member.