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State Councils Propel STEM Education

Key players try to coordinate efforts

By **Erik W. Robelen**

As STEM education gains ever more prominence, statewide organizations are springing up from coast to coast to advance and better coordinate the cause.

Arizona, California, Iowa, and New York are among the states where STEM education networks and councils have been launched in the past few years. They typically bring to the table a diverse set of players in the state, including representatives from K-12 and higher education, leaders in government and business, as well as nonprofits and other community organizations.

A national coalition called **STEMx**, announced last year, counts 16 member state networks, but the numbers go well beyond that, including with the Governor's **STEM Advisory Council in Iowa**.

"I've watched these pop up like popcorn," said Jeffrey D. Weld, the executive director of the Iowa council, which Gov. Terry Branstad, a Republican, established through an executive order in 2011.

"You get this vast hue and cry for STEM, which is a good thing, but then you have to enact something," said Thomas T. Peters, the executive director of **South Carolina's Coalition for Mathematics and Science**. "A lot of my friends are using the term 'random acts of STEM,' which is a lot of what happens."

He added, "That is one of the drivers of all these various collaborations, confederations, whatever you wish to call them, to be more purposeful in what we do in terms of STEM education."

For Mr. Peters, whose organization actually dates back two decades (though the name has

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changed, he says), the agenda should center on the three C's of communication, collaboration, and coordination.

Road Maps

The particular strategies of state organizations vary considerably, but their work has included drawing state road maps for improvement in the STEM subjects, launching STEM-focused schools, providing grants for individual projects, and advocating a policy agenda.

One common thread in many state organizations is creating regional "hubs" that work at the local level to advance STEM with a particular focus on the needs and resources in different communities.

Funding for the networks varies, but often includes state and private aid, or even federal Race to the Top dollars.

The Seattle-based Bill & Melinda Gates Foundation has been a key funder for a number of the networks, including in California, New York, and Ohio.

In 2011, for instance, it announced a grant of \$10 million over five years to launch and support a new group called Washington STEM in its home state. (The Gates Foundation also provides support for coverage of business and innovation in *Education Week*.)

Claus von Zastrow, the chief operating officer of Change the Equation, a Washington-based coalition of corporate chief executives that promotes STEM education, said he's encouraged by the proliferation of the state networks.

"They're varied, have different kinds of mandates, different levels of power," he said. "The real hope is that if you bring all these actors to the table, they can ensure that all the different stakeholders in the state will be pulling in the same direction."


'Rooted in Innovation'

The increased focus on STEM education is driven in no small part by concern about the role the fields of science, technology, engineering, and mathematics play in the nation's economic competitiveness and the need to fill jobs now and in the future in those areas.

The issue has gotten the attention of President Barack Obama, who addressed STEM education and jobs in his [State of the Union Address](#) this month, as well as that of state leaders.

"In Massachusetts, the economy is really rooted in innovation, and so much of that innovation requires people with skill sets in and around STEM at all different levels," said Lt. Gov. Timothy P. Murray, who chairs the Governor's STEM Advisory Council in that state.

Mr. Murray, a Democrat, said the council, formed in 2009, brings together some "high-level players," such as the president of the University of Massachusetts system, the head of the Museum of Science in Boston, and senior officials in business and industry. In addition, it includes school superintendents and other educators.

In 2010, the council produced a detailed **strategic plan for "excellence in STEM education."** 

Last year, it issued two rounds of grants to fuel STEM learning activities. For instance, it awarded \$350,000 in grants for seven initiatives, matched by more than \$1 million in private money.

The combined grants included \$268,000 for the DIGITS Project, which pairs STEM professionals with 6th grade classes to increase student interest in STEM subjects and careers, and nearly \$150,000 for the Advanced Robotics Initiative, which provides summer and after-school opportunities for K-12 students.

The Arizona STEM network, created in response to a call from Gov. Jan Brewer, a Republican, got started in 2012.

"What Arizona saw, there was a proliferation of activities relating to STEM education, but in a lot of ways, ... it's been very disconnected," said Darcy R. Renfro, the coordinator of the state network and a vice president at the Science Foundation Arizona. "What we were asked to do was to coordinate, to really leverage and link all the STEM initiatives happening, and elevate STEM."

The network received a small amount of startup money from the state, but has since raised \$6.6 million from private funders, said Ms. Renfro, including Intel Corp., JP Morgan Chase, and the Helios Education Foundation.

One top priority, she said, is to better understand and promote high-quality STEM education offerings.

"There are a lot of programs out there that say they are STEM, ... but there is little data on what really is effective," Ms. Renfro said. "That's a big piece of what we're doing, trying to identify what quality is and help teachers, parents, and administrators make good decisions about they do bring to their kids."

Creating Regional 'Hubs'

Two priorities for the Tennessee STEM Innovation Network, formed as a result of an executive order by then-Gov. Phil Bredesen, a Democrat, in 2010, were to develop regional hubs and help start STEM-focused schools.

The network has been fueled largely by a slice of the state's federal Race to the Top grant. It's a public-private collaboration between the state education department and the Battelle Memorial Institute, a nonprofit research and development organization that operates Tennessee's Oak Ridge National Laboratory.

"We've created six hubs across the state. We're trying to organize STEM partners in each part of

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the state, businesses like FedEx, Eastman Chemical, K-12 and higher education," said Wesley Hall, the director of the Tennessee network. "We're [involving] everything from teachers' unions to any kind of civic organization, Boy Scouts, Girl Scouts."

The network played a key role in creating eight STEM-focused "platform schools," with another opening next fall. For example, it provided \$2 million in Race to the Top aid to help create the L&N STEM Academy in Knoxville, a new magnet high school.

"All kids experience hands-on learning during the day; corporate partners bring in real-world experience," Mr. Hall said of the new STEM schools. "If they want to be engineers, it's amazing to bring in an engineer from Volkswagen."

The new public schools, which are open to all students, ascribe to a set of 10 design principles, such as providing enhanced STEM learning, offering an integrated curriculum across subjects that "nurtures imagination and creative thinking," and committing to share best practices with other schools.

The Iowa STEM council has drafted 19 recommendations to improve STEM education, said Mr. Weld, the executive director, and is producing a set of manuals to help with implementation on such topics as turning a school into a STEM school and how to license and prepare STEM teachers.

In addition, drawing largely on \$4.7 million in recently awarded state aid, the Iowa council has awarded small grants for "quality STEM programs," he said.

The council has a team of just three full-time staff members, including Mr. Weld, but the network has hired six regional managers working locally with the business and nonprofit sectors and others "to forge ... partnerships and alliances we think will be sustainable long after the state money runs out," he said.

Some of the statewide organizations, such as the California STEM Learning Network, play an active role in the policy arena.

The California group pushed hard to defeat a proposal Democratic Gov. Jerry Brown included in his budget plan last year that would have eliminated a second year of science as a minimum high school graduation requirement, said Marcella Klein Williams, the network's chief education officer.

The network's website lists five policy and advocacy priorities, including adoption and implementation of the common science standards being developed by 26 states, revising state and federal accountability systems to place greater weight on science, technology, and engineering, and ensuring all California students have access to high-quality STEM activities in out-of-school time.

'Endless Bandwagons'



Mr. Peters from the South Carolina coalition said he's encouraged to see the recent proliferation of statewide STEM organizations around the nation, suggesting they hold the potential to effectively harness the groundswell of interest in STEM education coming today from so many places.

He cautions that it's critical to channel the energy and resources out there into productive and coordinated efforts that truly improve STEM learning for young people, and not miss a ripe moment of opportunity.

"We put teachers through endless bandwagons of the thing that's going to save education," he said, "and this can't be another one of those."

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Vol. 32, Issue 22, Page 8