



Iowa Governor's STEM Advisory Council

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Jeffrey Weld, executive director of the Iowa Governor's STEM Advisory Council, credits a 2009 conversation in the lobby of a Best Western hotel with kick-starting a statewide STEM "edu-nomic development initiative" that has elevated STEM to the top of the state's educational priorities, increased academic performance in math and science, created community-based business-education partnerships, and raised greater public support for STEM education.

At the time Weld served as the director of the Iowa Mathematics & Science Education Partnership. That conversation, with an executive from Rockwell Collins and an official from Iowa's Department of Education, focused on the need to expand the partnership's good work into a more comprehensive statewide STEM initiative. The three discussed stakeholder groups—K-20 leaders and educators, business and industry executives, heads of nonprofit agencies, and elected officials—that needed to be part of a larger conversation. Planning commenced, a meeting date was chosen, and invites were sent.

The first tangible outcome of this conversation was the 2011 publication of the Iowa STEM

Education Roadmap, a strategic plan for STEM education statewide. The Roadmap focused on priorities such as boosting student performance in STEM, improving the preparation of teachers, promoting public awareness of STEM, preparing a STEM workforce, forging links between education and business, and coordinating STEM education opportunities.

Winning gubernatorial support

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executive order by the Governor, establishing the Governor's STEM Advisory Council in 2011, and a \$4.7 million appropriation by the state legislature in their 2012 session, devoted to creating programs to achieve the goal of increasing K-12 youth performance in STEM courses and interest in STEM careers. Since then, the Iowa legislature has continued to strongly support Iowa STEM, increasing the appropriation to \$5.2 million in 2013 and sustaining at that level to date.

Council members roll up their sleeves

Nearly 50 state leaders across business, education and state and local government serve on the Council. Tangible examples of its work include:

- Identifying and scaling proven pre-K-12 STEM education programs through the STEM Scale-Up Program.
- Providing summer "externships" where secondary STEM teachers work alongside skilled industry professionals and experience the real-world applications of their STEM curriculum, which will help them prepare students for future careers.
- Partnering with STEM industry leaders to give Iowa students opportunities to gain industry-recognized certifications.
- Creating strong school-business partnerships that prepare students for STEM career pathways such as manufacturing, information technology, bioscience, and finance.

Identifying key partners is a strategy that the Council uses to help it accomplish its ambitious

goals. For example, as Iowa was looking to scale up proven STEM education programs, Change the Equation (CTEq) was putting final touches on its own efforts to identify high-quality K-12 STEM learning opportunities. A mutually beneficial partnership was born in 2014 and continues today.

"CTEq wanted a way to identify proven and scalable STEM education programs, so we created STEMWorks, which is based on our [Design Principles for Effective STEM Philanthropy](#) and an accompanying [Rubric](#)," Linda P. Rosen, CEO of CTEq, said. Each program has been vetted by [WestEd](#), an independent nonprofit research organization, and meets a very high bar for quality.

The recommended programs included in Iowa's STEM Scale Up Program were subject to the same rigorous vetting, using Iowa reviewers, as those in CTEq's STEMworks program. Iowans should be confident that the recommended programs in the Council's program are of the highest quality and are proven effective, Rosen added.

Transformative impact

While many measures of success exist (see sidebar, p. 5), Weld said one of the Council's proudest accomplishments to date is that "STEM has been such a catalyst for accelerating conversations about re-examining schooling in local communities statewide. Education has become much more student-centered, and schools have become a much more intentional part of the local community. Local businesses are partnering with their local schools to create more industry-school partnerships and work-based learning opportunities as well as co-writing curriculum."

Of the state's 333 school districts, 315 have been involved in one way or another with the Council's STEM efforts, Weld said. The STEM Scale Up partnership with CTEq reached up to 100,000 students a year—more than one in five K-12 students in the state.

"Schools and communities realize that if you're not in you're being left out. Every school wants to be part of this effort," he said.

Lessons learned

Weld, who has served the Governor and Council as executive director since its founding, reflected on its successes as well as three important lessons learned.

First, state funding is critical for efforts such as these to succeed.

"I see the potential in so many states, where the infrastructure is fantastic and the human resources are in place, but they lack funding. We convinced our state legislature that without funding we'd have limited impact," he said.

Second, framing the Council's importance to economic development rather than just education worked to its benefit. The Council enjoys strong involvement of its business sector. Several company leaders have taken a turn serving as co-chair of the Council alongside Iowa's Lt. Governor.

Third, internal investment—on messaging as well as external evaluation—paid off exponentially. But neither were easy to attain, Weld explained.

"It's easy to overlook or rule out data collection when you get started," he said. "But impatient legislators ask, 'Where is the evidence of your effect?' We have avoided that pitfall and have data to back up our results."

And, regarding the need to communicate out to the public the work of the Council, Weld stressed that "if you don't tell your story, it's as if it didn't happen. STEM is now a buzzword, thanks in part to the messaging campaign."

Looking ahead

As for what's next for the Council, Weld notes a shift toward more regional and local-based decision making. He also acknowledges the need to engage colleges and universities more effectively and link STEM more strongly to the arts, humanities, and social sciences.

Ultimately, however, he feels confident that the Council has enough momentum to keep making a difference for young people in Iowa. "I don't have a crystal ball to know where the Council is headed, but I'm excited to see where it's going to go," Weld said.

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Evidence of Success

Each year an inter-university consortium of Iowa State University, University of Iowa, and the University of Northern Iowa evaluation centers assesses and measures how well the Iowa Governor's STEM Council is doing in raising STEM interest, awareness and achievement statewide. [Findings](#) from the 2015-2016 evaluation reveal the following results:

- Between 2011 and 2016 the share of students aspiring to a STEM bachelor's degree increased from 49 percent to 55 percent.
- More students of color as well as female students aspire to achieve a STEM-related bachelor's degree. (38 percent of African American students in 2011 to 47 percent in 2014; 46 percent of Hispanic students in 2011 to 55 percent in 2015.)
- 73 percent of STEM Scale-Up Program Educators have learned effective methods for teaching in STEM content areas.
- Since 2009, 347 Iowa teachers have worked with 118 Iowa workplaces via the Iowa STEM Teacher Externship Program.
- Nearly 2,500 students received certification via the Microsoft Imagine Academy in FY2016, a 30 percent increase from the previous year.
- 87 percent of Iowa residents support their state's efforts to develop initiatives to promote STEM education statewide.

Change the Equation (CTEq) works at the intersection of business and education to ensure that all students are STEM literate by collaborating with schools, communities, and states to adopt and implement excellent STEM policies and programs. CTEq's coalition of business leaders are working toward universal STEM literacy by advocating for state policies and practices that are known to produce STEM-literate high school graduates; ensuring high standards for all students; and supporting evidence-based high quality STEM learning programs.

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