STEM EAST RESHAPES LANDSCAPE IN NORTH CAROLINA

A Pipeline to Industry

A Havelock Middle School student pulls down on the handle of the injection molder as part of an activity at the Plastics and Polymers workstation in the school’s STEM center.

Photo courtesy of Rod Dutton
North Carolina’s rolling fields of tobacco began to dwindle in number, and cotton was in less demand as textile manufacturers moved outside the United States following passage of the North American Free Trade Agreement. The physical landscape in the state at the end of the 20th century changed—rapidly and permanently—and, consequently, so too did the economic landscape.

What could be done to keep the state a vibrant player in manufacturing and production as it entered the 21st century? How could the economy be transitioned and the necessary workforce be retooled and reshaped? North Carolina’s Eastern Region (NCER), an economic development agency, recognized the impending economic evolution and devised a collaborative plan with area leaders to achieve true and lasting change—alignment of regional education and workforce development systems.

If history is a good indicator, turning around the Titanic would have been an easier chore than quickly retooling the existing education system. Unfazed though, NCER officials, well versed in the economic needs of business and industry in their 13-county territory, discerned that the education process would have to be modified if the desired outcome was a 21st-century workforce that would attract 21st-century businesses—from aerospace to life science to financial services to advanced manufacturing.

The result of those deliberations was the formation of STEM East, which was launched by NCER in 2011. With a mission to facilitate public/private partnerships, establish STEM centers and programs, and develop a strong network of STEM teachers, STEM East had a huge task spilling over its plate from the outset. Finding the right leader for this new group was a crucial first step. Only someone who could fully understand and empathize with both sides—business and education—would be handed the reins. Enter Steve Hill, a native of the eastern region of North Carolina who was raised on a farm, earned a degree in business, became a teacher and eventually became a secondary administrator in Lenoir County. Hill’s passion for his home and education was undeniable, but his ability to communicate and facilitate consensus made him the best man for the job.

Since becoming executive director of STEM East, Hill has worked tirelessly to respond to the regional workforce skills gap and help mold a new brand of employee skilled to fill the jobs that have been replacing those lost when tobacco, textile and apparel began to wane.

Hill says STEM East members want to “grow our own.” Workforce, that is. And the early crops are already blooming. Hill, though, continues to cultivate the field and has his sights set on only one thing: a bumper crop of custom-skilled workers. STEM education is his soil of choice.

An Agent of Change

Early on, NCER acknowledged that the silo approach—each entity concerned primarily with its own processes and outcomes—would have to go away. STEM East would need to break new ground with an approach that would benefit everyone equally and collectively. An estimated 42 percent of new jobs being created in North Carolina require at least some specialized postsecondary education, often in the STEM areas, so private industry, government organizations, community groups, schools, colleges and universities had to agree to shed their own interests in favor of the greater good.

Air Vehicle Engineering Department
Once in a while, the tables are turned, and instead of serving as a font of inspiration, teachers are on the receiving end. It can be a rejuvenating role reversal, actually. For Marlena Bleau, a STEM center facilitator at Havelock Middle School in Havelock, New Jersey, it started when she was awarded a fellowship through the Kenan Fellows Program at North Carolina State University in 2012. The program strives to empower teachers to be innovative in the classroom and to motivate students to achieve even greater results.

The prestigious Kenan Fellowship enables select teachers to pair up with a university or industry partner to explore more deeply a new process or program they can share with their students. Bleau’s fellowship was funded by Fleet Readiness Center (FRC) East on the Marine Corps Air Station at Cherry Point, and her mentor was Air Vehicle Engineering Department Head Mark Meno.

Bleau opted to focus on composites (materials engineering). She spent five weeks in the summer working at FRC East, learning about the use of composites in repairs to military aircraft. “The Kenan Fellowship was by far the best leadership and professional development program I have ever experienced,” she said. “I had no idea that I would be able to connect my community to my classroom so seamlessly.”

Steve Hill, executive director of STEM East, which has helped increase the number of Kenan Fellowships awarded in the eastern region, said Bleau, as a result of her fellowship experience, was instrumental in the development of the new Composites module used in Pitsco Education STEM labs across the country.

Hill aims to have the 17 eastern region Kenan Fellows awarded during the past three years (after only two in the previous 10 years) network with other STEM center teachers and share their activities and lesson plans, further spreading the inspiration.
cere stores, gas stations and other service businesses that cater to the needs of the entire population.

Local companies such as Bridgestone/Firestone, West Company, NACCO Materials Handling Group, Cooper Standard, Keihin, Vidant Medical, FRC East and Spirit AeroSystems provide jobs for STEM-skilled workers, so maintaining that pipeline of talent is a key to keeping those businesses in the region and attracting new ones.

“The workforce is a driving factor on whether businesses will locate here,” says Tom Vermillion, owner of DEPS Security Systems and vice president of the Committee of 100 in Lenoir County, a group of primarily small business leaders who championed the development of STEM East.

“You’ve got to have people who know what they’re doing. It’s a huge catalyst. It’s one thing to say we’ve got this big building you can move into. If there aren’t any people that can fill it, you’re going to lose your company pretty quickly. You’ve got to have a workforce. Now, we’re preparing the workforce that can fill those jobs.”

**Retooling the Schools**

Traditional career and technical education (CTE) programs have been evolving for the past two decades, from woods and metal shop classes to career-specific curricula anchored in hands-on applications of engineering, math and science skills. Once thought to be a “career track” for students whose sights were not set on a college degree, CTE now incorporates core content in the STEM areas, and it is being implemented much earlier than the latter half of high school.

Hill says it’s too late if students wait until high school to begin entertaining thoughts about specific career options or to sample the jobs that interest them. College courses are now being offered earlier in high school, and students and parents must be made aware sooner of potential career pathways to emerging job opportunities, says Hill.

“When we sit down with a company looking to locate here, the question is always, ‘What are you doing to give me a workforce, a skilled workforce?’” And when that company signs on the line to locate here, it’s usually a five- to seven-year period before they reach peak hiring,” Hill explained. “Those kids are sitting in the K–12 system. … We’re starting with upper middle school and even reaching down into elementary schools. At the same time, this brings relevancy to math and science
classes for students and parents. We have to make clearer the gains realized through the connection of coursework with careers and a higher standard of living.”

The biggest push so far has been the implementation of middle school STEM centers in which students rotate through Pitsco Education modules that give seven-day experiences in various careers such as alternative energy, robotics, electronics, composites, structures, genetics, climate and biomes, forensics, body systems and more. Students use the same equipment, materials and software found in industry settings to complete activities in pairs at their own pace, based on instructions delivered via audio, video and graphics on the computer.

“It’s kind of interesting when you walk through and have the Plastics and Polymers module going on, and the guy from Bosch-Siemens says, ‘Hey, that’s exactly what we do in our plant,’” said CTE Director Bailey. “We feel pretty comfortable in the fact that we hit a lot of great skills. Now, it’s a matter of where do we go in business and industry as far as building out the pipeline throughout high school.”

Science-rich STEM labs have been added in more than half of Craven County’s elementary schools this year in an effort to get even younger students more comfortable with hands-on career exploration.

Teacher education and preparation are major considerations. Collaborative opportunities, such as the Kenan Fellows Program at North Carolina State University (see sidebar), are being made available to teachers—thanks to STEM East—so that they can receive on-the-job experiences that help them stay in touch with the modern-day workplace.

“We find that teachers who teach for a long period of time don’t get or take the time to go into industry to hone skills that are being used,” Bailey said. “Kenan Fellows has provided that externship experience, allowing teachers to work side by side with industry partners. They’re able to relate those experiences to students and have a better understanding of how to guide those students with decision-making skills.”

**The Future Appears Bright**

The transition to a new technology-centric economy in the eastern region of North Carolina has not been easy, but STEM East has begun to address what Hill terms an “employment problem,” as opposed to an unemployment problem.

“We’ve got the jobs, but the people are not there to fill those jobs,” he says. “Our job is to get these people aligned with the emerging jobs and emerging careers so that they’ll be employable.”

Meno, Vermillion, Bailey and other leaders are optimistic that education is headed in the right direction. “There seems to be a cohesiveness developing when you overlay the STEM East approach,” Meno says. “It’s still a slow go because that’s just the way it is, but I think we’re starting to reap some of the benefits already.”

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