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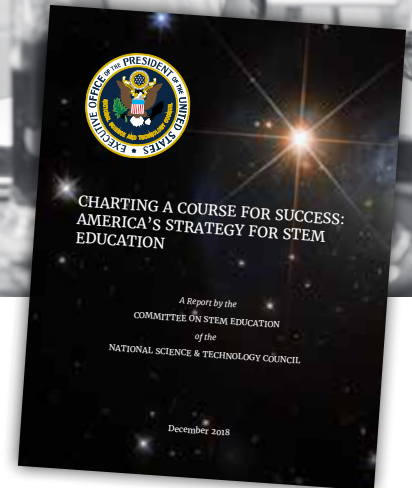
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GETTING DOWN TO BUSINESS

Economic development leaders bring
education and business to the same table

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"Tomorrow's workers are today's learners, and the learning experiences provided to them will directly impact how many decide to pursue STEM careers as well as how ready they will be to do so."

PARTNERING, PLANNING, AND PASSION

have fueled a STEM-focused approach to improving and growing the Eastern NC workforce

More than a dozen years ago, the predecessor of NCEast Alliance began partnering with local employers, workforce development boards, and community colleges in eastern North Carolina on a coordinated effort to improve the quality of the regional workforce.

We invested in promoting ACT® WorkKeys® assessments (utilized by employers to clearly define jobs) and National Career Readiness Certificate testing (for job candidates), which had been endorsed by the National Association of Manufacturers. These efforts resulted in significant increases in persons possessing a certificate and aided employers by cutting costs through a reduction of time to onboard new employees and achieving lower turnover rates.

After a few years, though, we realized this was not the entire solution, and we were approached by NC STEM about launching a regional science, technology, engineering, and math initiative in public schools. We undertook an engagement process to determine what was needed, and with the input of public school leadership, teachers, students, parents, and employers, we embarked on a new journey involving all these parties and Pitsco Education as partners. The STEM East ecosystem was born!

At the suggestion of a local school district CTE director, we adopted the concept of introducing Pitsco STEM learning centers into middle school classrooms – changing the way classrooms were organized, changing how content was delivered, engaging students in the decisions about specific topics studied, providing teacher professional development, and engaging employers.

This effort proved wildly successful with significant increases in student performance, and we benefitted from our past experience

with ACT profiling. We were able to use this context to benefit our school districts and our employers, and we have developed a more robust talent pipeline that serves our region well.

With support of the NC Science, Math, and Technology Center and the Smithsonian, we have now assisted our school districts with the development of STEM strategic plans that help fill gaps in the STEM educational pathway that leads students to college or careers. Our employers are so pleased with the progress that many of them pay a membership fee to support STEM East and to have a seat at the table to discuss next steps to improve student achievement and connections to the workplace.

Our school districts have benefitted in many ways including the attraction of roughly \$14 million of external funding to support STEM education improvements. Finally, the recognition and mimicry of what we have accomplished has been professionally rewarding for all of us. 

“With support of the NC Science, Math, and Technology Center and the Smithsonian, we have now assisted our school districts with the development of STEM strategic plans that help fill gaps in the STEM educational pathway that leads students to college or careers.”

– NCEast Alliance President/CEO John Chaffee

John D. Chaffee
President/CEO





JOINING FORCES

By Tom Farmer

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Early results promising for businesses and education collaborating in NC

GREENVILLE, NC – Education and business leaders advocate the need to break down the silos in which they have traditionally operated. After all, their common aim is a well-prepared workforce, so a unified effort clearly makes sense. But what does it really look like when talk turns into action and the silos disappear?

For a clear picture, look no further than the eastern region of North Carolina, where for the past eight years business and education leaders have emerged from their boardrooms and district offices, come together at the table, and tackled long-standing issues that had resulted in a repeated disconnect between what education was producing and what businesses needed in their employees.

The catalyst for this change has been STEM East, an offshoot of NCEast Alliance, an economic development group focused on shaping a transitioning work landscape. STEM East officials formed the Eastern North Carolina Employers and Superintendents Council with superintendents from the 12 school districts

in the region and 11 key business and industry leaders whose companies rely on local school systems for their most important commodity – that well-prepared workforce.

“We want a workforce of inquisitive minds. We don’t want somebody to take the notebook that says, ‘Here’s how we’ve always done it.’ We want a workforce that can take us to the next level,” said Duke Energy Government and Community Relations Manager Millie Chalk. “And that to me is what STEM is providing us, and that is what our commitment to STEM education in North Carolina is really about – How do we build a better workforce? How do we grow our economy to be more productive and to do more and be more? That really comes from a grassroots effort in education.”

Businesses are eager to step up and support education when it clearly listens to and meets their needs. In eastern North Carolina, that is happening through ever-growing K-12 STEM programs that engage students, add relevance to their education,

expose them to careers in the region, and cultivate soft skills needed in today's workforce.

"This pedagogical approach to inquiry uses the idea of, 'We are going to be developing you as a student who can work in a group and ask questions of each other and communicate with each other and make your own presentation about what it is that you're learning,'" said STEM East Executive Director Bruce Middleton. "These are discrete skills that you can work on, and they are important for the workplace."

STEM, STEAM, STREAM, and similar approaches are more about developing these essential skills that will be key to employability in the future if the recent past is an accurate barometer. According to a 2017 US Bureau of Labor Statistics report, "Employment in STEM occupations grew by 10.5 percent . . . between May 2009 and May 2015, compared with 5.2 percent net growth in non-STEM occupations."

National jobs data is telling, but even more important to employers in the region are projections that their future employees will have the knowledge and skills necessary for open positions, work well together, and desire to stay in the area. Toward that end, major employers such as Duke Energy, Fleet Readiness Center East, Hyster-Yale, and regional health care providers have representatives on the STEM East advisory council. They share best practices, help fund STEM programs, put on summer camps, offer a mobile Fab Lab, mentor and train teachers, and offer internships and field trips to give educators and students a glimpse at the job opportunities in their own backyard.

Mark Meno, research and engineering group head at FRC East, where about 850 engineers are employed, said clearer communication has been helpful in breaking down the silos. "Education is only reacting to what they think they're hearing from industry, and industry is not a clear communicator because we can't speak educationese," he said. "So, a lot of times we end up with this weird alignment issue that misses the mark slightly, and 10 years later we look at the output and we're like, 'Uh oh, that went wrong.' . . . STEM East is addressing the issue. The conversation is happening at the table."

Further proof of progress, says Onslow County CTE Director Chris Bailey, is that the eastern region is a certified work-ready community based on jobs being profiled by ACT® WorkKeys® and students being rated on National Career Readiness Certificate® testing.

"What that does is it shows that there is solid alignment between secondary and postsecondary programs and industries to show that we're trying to build a superhighway with multiple on- and off-ramps where students can get the careers they want," Bailey said. 



Business and education leaders in the STEM East region of North Carolina recently visited Bridgeton Elementary School in New Bern, where a \$25,000 Duke Energy grant helped fund a Pitsco STREAM Missions lab for students in Grades 3-5.



Bruce Middleton
STEM East Executive Director



Millie Chalk
Government and Community
Relations Manager, Duke Energy



Mark Meno
Research and Engineering
Group Head, FRC East



Chris Bailey
Onslow County CTE Director



By Tom Farmer
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Health care providers connect directly with educators

Teachers educate students about careers, but who educates the teachers – and administrators and school counselors – about the good-paying jobs that are readily available in their communities?

In the eastern region of North Carolina, businesses are taking it upon themselves to educate the educators directly.

“What we want to do is let the school systems know and the teachers know and the counselors know that there are good-paying jobs right here in Lenoir County,” said UNC Lenoir Health Care Human Resources Director Jimmy Person. “We want to teach the students that you don’t have to go other places. You can go to Lenoir Community College and get a degree in radiology and get a \$50,000-a-year job two miles away.”

At UNC Lenoir Health Care, there’s a shortage of nurses and nursing assistants (See related article on page 11.) in particular. The same goes for the region’s largest health care provider, Vidant Health in Greenville. Vidant is continually seeking qualified nurses and other health care professionals.

The two health care providers have something else in common – a seat on the 11-county Eastern North

Carolina Employers and Superintendents Council. Person brings 35 years of hospital HR experience to the council’s quarterly meetings. Vidant’s Chief Human Resources Officer John Marques has been part of the council for about three years.

“Vidant was a member and early supporter, having recognized STEM as key to economic and workforce development,” Marques said. “By being part of such a vibrant and forward-thinking group, we can play a key role in support and advocacy of STEM education and programs for eastern North Carolina. Given the socioeconomic demographics of the area, we believe STEM can ignite an engine for growth.”

The two men appreciate an opportunity to effect change at a grassroots level. “By being around the table, developing relationships with the superintendents and the other representatives on the STEM East council, we can bring back ideas to our county,” Person said. “About a year ago we had all the counselors here and showed them the hospital, gave tours, presented the kinds of jobs that we have here. . . . It’s just surprising that students don’t really know what’s available to them.” 



Duke Energy seeks inquisitive new employees

NEW BERN, NC – Duke Energy is one of the largest electric power holding companies in the United States, and to maintain that position it needs to attract top-performing students, particularly those who have developed STEM skills through hands-on experiential learning and exposure to the engineering design process.

“As we look at the upcoming workforce, we want inquisitive minds,” said Government and Community Relations Manager Millie Chalk. “We want a workforce that can take us to the next level. And that to me is what STEM is providing us, and that is what our commitment to STEM education in North Carolina is really about. How do we build a better workforce? How do we grow our economy to be more productive and to do more and be more? That comes from a grassroots effort in education.”

Among Duke Energy’s investments in STEM education are grants that have helped establish Pitsco Education labs in elementary and middle schools in the eastern region of North Carolina where for years the STEM East network has been making inroads and connecting business and education representatives.

Chalk recently spent time at Bridgeton Elementary School in New Bern, where a \$25,000 Duke Energy grant helped fund a Pitsco STREAM Missions lab for students in Grades 3-5. Principal Melisa Thompson said she and her staff were excited when the lab was announced, primarily because of the known potential benefits of STEM education delivered in a collaborative way such as the four-person Crews who complete Missions work.

“Anytime you can give kids inquiry-based learning, it’s exciting,” Thompson said. “They learn how to think and how to problem solve and how to explore. In preschool and kindergarten they learn through play. Well, with the older kids it’s not play, but it is exploration.”

Not to mention the built-in engineering design loop where students learn that it’s OK – even good – to fail, as long as they try again while making changes in an attempt to improve.

“We learn from our failures, and hopefully we come to a better solution,” said Chalk, who briefly taught physics and chemistry at the secondary level before returning to college to earn an engineering degree that led to a position with Duke Energy, where she has worked for the past 28 years. “Obviously, you don’t want to have a failure and it be catastrophic, but you do want people to know that it’s OK to have an idea that might not be the right idea, but it might lead to a better idea. So, I think that format of learning is very important.” **P**



Bringing down the silos

Hyster-Yale official credits STEM East for getting business and education on the same page

GREENVILLE, NC – A couple decades ago, the concept behind the STEM East network was inconceivable. Business and education were not only siloed, but there were few lines of communication between the two.

Wayne Washington is happy those days are mostly long past – at least in the eastern region of North Carolina. Washington is the human resources manager for the engineering group at Hyster-Yale in Greenville, a leading international manufacturer of lifts. He also serves on the Eastern North Carolina Employers and Superintendents Council, which is comprised of school superintendents and business and industry representatives from an 11-county region.

“STEM East has been excellent. They represent what is needed in the workforce,” Washington said of the third-party entity that has been tearing down the silos and blending business and education into the natural mix it should have been all along. “They’ve been an excellent collaborator and consultant, bringing business, industry, and education together so that we could form these programs and help these kids out.”

Working closely with educators on the council, business representatives can share ideas for how best to prepare the region’s future workforce. Hyster-Yale’s production plant and offices in Greenville need a steady supply of engineers and skilled manufacturers, who benefit from hands-on STEM programs and related courses throughout their education.

In addition to promoting the implementation of STEM-related programs and activities at all age levels, Hyster-Yale wants students as young as middle school to visit their facility so they can see firsthand the well-paying jobs that might be available when they graduate from high school, community college, or university.

“We’re more in need of soft skills and knowledge in terms of science, technology, engineering, and math; the ability to work in teams and collaborate,” Washington said. “When they can see us physically working and can see what we do on a daily basis, they’re more educated and ready when they come out to actually work here or someplace else. It benefits the economy because we have a more educated workforce.” **P**



**By Cody White
and Tom Farmer**

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LOCALLY GROWN ENGINEERS

Middle school exposure is sweet spot for entry, according to officials with FRC East, Hyster-Yale

CHERRY POINT, NC – “I had to live in Marshallberg. It was just that simple,” exclaimed Ramsey Davis, an engineer for Fleet Readiness Center East in nearby Cherry Point, NC. “I’m the 14th generation in Marshallberg. My youngsters are the 15th generation.”

Davis traces his lineage through generations of boat builders in the small coastal North Carolina town. He grew up in a boathouse, learning the ins and outs of structures.

Employees like Davis who have both advanced skills and deep local roots are immensely valuable to a region’s economy. This is particularly true in locales far from metropolitan centers, which tend to be filled

with attractions and incentives that draw millennial talent.

Increasingly, educators and industry leaders are learning to work together to build schools-to-careers pipelines that develop and retain regionally tailored workforces. This is exactly the kind of crossover that North Carolina’s STEM East network was designed to foster.

But getting the fine details of the pipeline right isn’t just a networking matter; it’s also an engineering problem. No doubt this is why two regional employers with rich pools of engineering knowledge – FRC East and Hyster-Yale – have been so impactful.

STEM INVESTMENT NOW PAYS DIVIDENDS LATER

FRC East employs about 850 engineers in its mission to maintain and modify Navy and Marine Corps vertical lift aircraft. Research and Engineering Group Head Mark Meno has given much thought to ways the organization can offset attrition by hiring locally.

He has determined there is a need of about 50 engineers a year. But not just any 50. “I need 50 that want to stay here. . . . And the most likely population of 50 that want to stay here are the 50 that are already here.”

The key, FRC East suspected, was to appeal to regional students. So far, research has born this out. A survey of new hires asking what drew them to the company revealed that after internships, the second most influential factor was exposure through middle school engineering camps supported by the company years before.

“The yield we get from our investment in recruiting fairs and related efforts – even at our target engineering schools with whom we are strong employer partners – pales in comparison to what we get from our local interactions,” said Meno.

Along with engineering camps at the middle school level, FRC East prompted an arrangement in which North Carolina State University would offer a satellite engineering degree program on the campus of nearby Craven Community College. Davis is one of the program’s early graduates.

According to Meno, his company expects a significant upsurge of local applicants with engineering degrees in the next few years. This is because students originally exposed to STEM in the middle schools are at last beginning to graduate.

Additionally, the investment in tuition for local talent, resulting in an increase in retention and reduced costs to train them when they come on board, actually results in a savings of approximately \$10,000 per local engineering hire when compared to a traditional candidate.

Pitsco’s STEM curriculum is part of this picture. Present in numerous middle schools throughout the STEM East region, curricula such as the STEM Expeditions® emphasize hard science knowledge through hands-on learning and real-world application. According to Meno, who has visited Pitsco labs, this approach fosters interest well.

A constant need for engineers and artisans at FRC East, left, and Hyster-Yale, below, in North Carolina has led officials to begin their recruiting efforts at the middle school level.



MOBILE FAB LAB FURTHERS STUDENTS' HANDS-ON ENGINEERING EXPERIENCES

FRC East has taken a multitiered approach to spreading STEM knowledge and enthusiasm among students in the region. One tool for this mission is the Fab Lab, or mobile fabrication lab. The lab, housed in a trailer that is driven from school to school, is equipped with scanners, 3-D printers, laser cutters, laptops with design software, and more. The goal was to give students the opportunity to take their school engineering projects to the next level, inspiring them to think about building prototypes.

Regional teachers were invited to tour the lab. Afterward, they created lesson plans that utilized the lab’s resources. The lab visits schools for as long as a week, and students

make extensive use of it. In cases where a teacher might not have a clear vision for a project, Randall Lewis, an electrical engineer with FRC East and the manager of the Fab Lab, has created projects for students.

Teachers have been quite innovative, however. Several have used the Fab Lab in conjunction with Pitsco curricula.

One such project involved enhancing water bottle rockets. “The kids came into the lab and were able to 3-D print or laser cut fins for the rockets,” said Lewis. Pitsco CO₂ dragsters also had a turn in the lab. “We used the Fab Lab to cut out the shapes on the bandsaw. . . . And then we use the drill press to drill the axle hole so we could get it perfectly straight.” 



Wayne Washington
HR Manager, Hyster-Yale

"The point of the activities in the Pitsco way of learning seems to hit the kids and say, 'I can do this, and this is cool.' So now we've got them excited."

THE SOFT-SKILLS ADVANTAGE

In Greenville, a bit further inland, engineering heads at forklift manufacturer Hyster-Yale were developing a similar line of thought: millennials are essential to the company's future. The company began bringing student tours to their facility to educate them about day-to-day work processes. Company reps visited classrooms as well, both in person and through online video conferencing.

According to Wayne Washington, HR manager for the company's engineering group, this kind of exposure has many pluses. "It benefits the child for one, because they are more educated and ready when they come out to actually work here or any organization they decide to work at. It benefits the economy

because we have a more educated workforce, and that's just a trickle-down effect for the whole. It's an ecosystem."

According to Washington, overcoming the silos that naturally develop in an organization is key to improving performance. The team-based approach promoted by Pitsco Expeditions emphasizes collaboration and knowledge sharing among students. These 21st-century skills are intentionally written into the design of the curricula in response to the needs described by employers. There is a growing awareness that our collective economic future depends on the cultivation of these skills.

"You have to be collaborative," said Washington. "You have to be in a team-based setting. It's not just me, me, me; it's we, we, we. It's very project driven. These soft skills have to be developed for us to survive 2020 and beyond." 



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ENGINEERS AGREE: THERE'S NO SUBSTITUTE FOR HANDS-ON EDUCATION

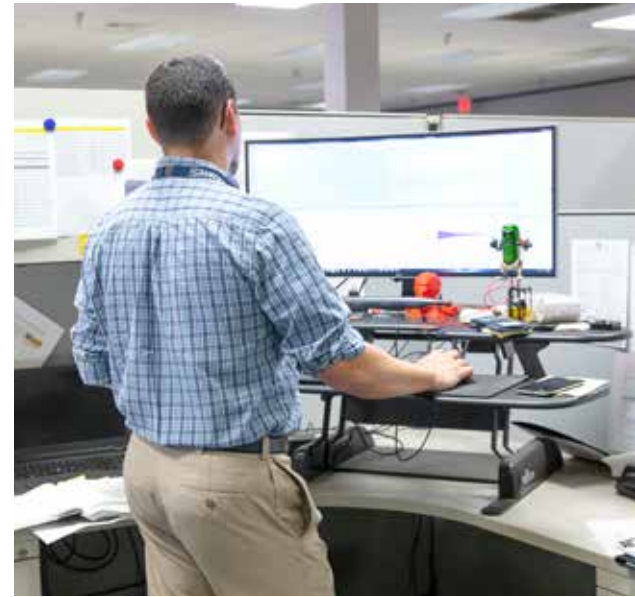
We want to give the current generation of young people the best opportunity to succeed in vital, well-paying careers such as engineering. So, it makes sense to heed the insights of those who have already made it. Engineers and other professionals from two

companies in the eastern region of North Carolina shared their thoughts on the value of STEM and hands-on education.

Chris Barone is employed as an engineer at forklift manufacturer Hyster-Yale. In this role he virtually models production to identify



Hyster-Yale Engineer Chris Barone, below, says his hands-on experiences in the classroom were invaluable in paving a path to his chosen profession.



potential problems. Before coming to work for Hyster-Yale, he worked for a company that designs reactors for submarines and carriers. But his first exposure to engineering came while he was in high school. He chose engineering and architecture as areas of study and found himself modeling houses, drafting by hand and in CAD, and cutting on the lathe.

"Engineering principles I learned in high school helped me in college," Barone explained. "Some of the stuff in college I just opted out of because I already did it in high school." And what about in his career – did his hands-on work in class help him in the long run? "I don't even know how to quantify it. I don't even know if I'd be here without some of that stuff."

Ramsey Davis, an engineer at FRC East, didn't get much hands-on experience in school, but he got plenty at home, working for his family's boat construction business, and that exposure gave him an edge in his career. Still, he has a window into current trends in education through his wife, a school counselor and former middle school math and science teacher. He is hopeful about the push to give students hands-on STEM experiences. "I think it's a better approach," Davis said, especially since there are fewer opportunities for kids to get these experiences outside of class. "I think in today's world it's much more challenging to find those hands-on opportunities."

Pitsco Education has a heavy presence in schools in the NC East region. STEM Expeditions® give students hands-on, collaborative educational experiences, which offer benefits that hands-off, solitary educational experiences can't. Students are stimulated to solve problems, appreciate the differences between real world and theory, and work with others to achieve shared goals and overcome differences. These are skills that give employees an edge in STEM fields.

No wonder that employers in the region are excited to dedicate resources toward cultivating the STEM education culture that Pitsco and STEM East have been developing. Randall Lewis works as an engineer at FRC East, but he spends much of his time visiting schools, delivering hands-on experiences to students through the company's traveling Fab Lab program. In some cases, the Fab Lab acts as an extension to Pitsco classroom activities.

"One of our big pushes is try to build this culture of STEM here locally to us," says Lewis. "If we can foster that culture of STEM and technical careers, [regional students] don't have to be engineers, but like artisans, machinists, or sheet metal workers and things like that."

In other words, according to those who have made their way in the industry, STEM education benefits all. 



Ramsey Davis
Engineer, FRC East



Chris Barone
Engineer, Hyster-Yale



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BEEFING UP HEALTH CARE JOB EXPOSURE THROUGH EARLY EDUCATION

Meaningful experiences at elementary and middle levels are a starting point

KINSTON, NC – If the average sixth grader isn't interested in being a nurse or a doctor, chances are they won't give a second thought to a career in health care because they probably aren't aware of the other options. That's unfortunate. As one of the fastest-growing career fields, health care includes hundreds of occupations, many of them far removed from the nurse and doctor roles.

"You can work in health care and not have to work with blood or needles or stuff like that. There's a whole range of jobs," says UNC Lenoir Health Care Human Resources Manager Jimmy Person, who noted that nurse and doctor are just two of more than 300 different job descriptions

on file at the rural North Carolina hospital with just under 1,000 employees. There are positions in respiratory therapy, radiology, laboratory, IT, rehabilitation, nutrition services, medical records, and environmental services, to name a few.

The greatest employee shortage is in nurses and nurse assistants, which make up nearly one-third of the entire workforce at UNC Lenoir Health Care. The hospital is tackling this issue head-on by working with local school districts and Lenoir Community College to ensure local students know about the path to nursing and the many other available careers in health care.

A group of four nurses recently joined Person for a panel discussion focused on ways education could better enlighten and prepare students for careers in health care. One of the nurse panelists, Emily Baker, RN and BSN, works directly with patients. The other three draw from their experiences as floor nurses when attempting



to attract more qualified candidates to the open positions. Misty Emory is an employment coordinator, Stephanie Fox is a human relations generalist, and Laura Guinn is an education specialist and workforce development coordinator.

All panelists agreed that exposure to a variety of health care careers at the middle school level – or even earlier – is necessary to turn the tide. (See related story, “Joining Forces.”) Hands-on experiential programs such as Pitsco Education’s STREAM Missions for elementary (for example, *Being Healthy*, *Amazing Body*, and *Body at Work*) and Expeditions for middle level (for example, *Body Blueprint*, *Bio Research*, and *Vital Signs*) have been implemented in many schools across eastern North Carolina through the efforts of STEM East, an offshoot of the NCEast Alliance.

“I didn’t have anything like that in middle school. In high school I was in HOSA (Health Occupations Students of America) and I did competition one year,” Baker said. “But that’s the only exposure I got to the health care field before I went off to college.”

Allowing students to explore health sciences and careers via collaborative, real-world experiences in Missions and Expeditions can ignite a spark of curiosity that carries into high school where opportunities for deeper dives into specific careers can occur in CTE courses and pathways.

Guinn invites high school students to visit the hospital and learn more firsthand. “We’ve been involved in the Teachers at Work and Students at Work programs for two years now, and I coordinate job shadowing. They come in for a couple of hours and are able to observe the staff, ask lots of questions, and just learn about that job to see if they’re interested or if they’re not interested.”

Emory is particularly interested in better career exploration opportunities for students because her son is in his freshman year of high school and aspires to a career in pharmacy. “I’ve talked to him about different careers for years, about the different things that he could do in hospital settings and in other professions as well,” she said. “I don’t think that students at the middle school and even at the high school level know all of the different options and careers that are out there. . . . They really don’t have any idea that you could be a CT tech or you could be a medical laboratory technologist. They just don’t have that exposure in schools.”

If early exposure to careers is as essential as the panelists say, then an important second step is to get middle school and high school students to spend time in hospitals and clinics. “I think hands on in the classroom is great for learning about critical thinking and working through problems,” Guinn said. “STEM focuses more on these student-led activities, which is great for leadership. But I just think taking them into the workplace is such an important piece of preparing them.”

Emory added that students must be taught about job options in their region, which would require flexibility to customize curriculum and course offerings to meet the needs of local business and industry. “I think that school systems need to have more local control over development of curriculum,” she said. “So much of it now is coming from the legislative end. Teachers have to get this covered and get this covered and get this covered. But is that meeting the needs of the local market and really exposing students to opportunities?” 

Hospital officials agree that earlier and deeper exposure to various health careers might lead more students to choose that path.



Jimmy Person
Human Resources Manager,
UNC Lenoir Health Care



Laura Guinn,
Education Specialist and Workforce
Development Coordinator,
UNC Lenoir Health Care



The STEM lifeline in rural North Carolina

Golden LEAF Foundation supports capturing student interest in Grades 4-9

Golden LEAF Foundation at a glance

Creation: In 1999, the North Carolina legislature created the nonprofit Golden LEAF Foundation to administer one-half of North Carolina's share of the Master Settlement Agreement resulting from litigation with cigarette manufacturers.

Focus: The Foundation's mission is to assist rural, tobacco-dependent, and economically affected communities with economic transition. Its grant making focuses on critical issues facing rural communities: advancing agriculture practices, creating opportunity for job creation, helping retain crucial businesses at risk for leaving an area, and readying the workforce. The Foundation also works with schools to prepare students for college and the workforce and other priorities that help move communities toward economic vitality.

Results: The Foundation has awarded more than \$650 million in grants, resulting in:

- 63,053 jobs created.
- \$624 million in new payroll.
- 68,000+ workers trained or retrained for good-paying jobs.

Q What exactly is the Golden LEAF Foundation's role in increasing economic opportunity in North Carolina?

A The Foundation was established to be an endowment for the future of rural North Carolina. Because the state was the largest tobacco producer in the nation, the then-attorney general, who went on to become governor, advocated that the court settlement for North Carolina should include using a portion of the proceeds from the class action lawsuit to help the rural counties that were negatively impacted by the decline in tobacco production transition to new economic opportunities. So, Golden LEAF was created to assist with rural economic transformation by investing in the physical infrastructure and human talent needed by rural communities to replace the revenue lost and attract new economic opportunities so that people could choose to remain in rural communities that represented prosperous places to live, work, and play.

Q Can you give one shining example of what Golden LEAF Foundation is doing in conjunction with the STEM East network to impact rural education?

A One example is the investments Golden LEAF made in eastern North Carolina to help Fleet Readiness Center East (FRC East) and other companies acquire the talent they needed to grow their businesses. During the Iraq War, FRC East, whose mission is to repair damaged aircraft and helicopters and send them back into military service, found it needed to manufacture small numbers of parts to replenish depleted inventories so they would have the parts needed to repair then return aircraft to active duty. They needed engineers who knew how to reverse engineer and manufacture parts because many of the items needed to restore aircraft were not available and limited blueprints existed. FRC East was hiring individuals from national colleges of engineering and bringing them to eastern North Carolina to work. When those new hires got off the plane and drove into eastern North Carolina, they would say, "Where's a Starbucks? Where's the mall?" And immediately they would start looking for employment elsewhere. When STEM East came along, it gave them an organic strategy to develop talent, engineering and other, in their region. An FRC East head engineer now frequently comments publicly, "Now that we have partnerships with education through STEM East, the organization is able to save \$50,000 for every engineer hired because they're coming from surrounding rural communities and want to stay here. They're deeply rooted in these rural communities and would prefer staying there if good paying jobs are available."

Q Regarding ACT® WorkKeys® and the National Career Readiness Certificate®, how important is it that Pitsco's curriculum is aligned with these standardized tests?

A I think talent development strategies like this are very important because we are battling both a skills and interest gap. Employers indicate they can teach new hires the technical skills, but they find it difficult to also teach them employability or life skills. They constantly seek candidates who are coachable and can work in teams to collaboratively solve problems. Do they know what to do when they don't know what to do? Can they identify and filter through gobs of data to get to relevant information that's necessary to solve

a problem? Those traits are hard to develop and take a longer-term perspective, so having a workforce curriculum that aligns to and promotes both technical and employability skills is important.

Q Why is it important to intentionally build career exposure and experience into the school day at all grade levels?

A It's unfortunate that a lot of STEM curricula get bucketed into CTE, which traditionally is isolated from core academic courses that students take. I think having curricula aligned to career readiness helps connect career and technical education to core curricula in math, science, English, language arts, and social studies. Taking a more integrated approach that shows students, for example, how technical report writing or math gets applied in a career or a business sector is critically important. Math and science teachers, like all teachers, have so much on their plate, making it hard for them to gain a deep understanding of how the core content they teach is applied in the real-world such as in aviation, manufacturing, welding, or nursing. Having the Pitsco curriculum align to core subjects through pacing guides has proven effective in assisting students to learn how math is a critical skill that is relevant in an occupational career – we've seen that happen with Pitsco.

Q Have you visited any of the Pitsco STEM/STREAM labs?

A I've been to a significant number of schools that uses the Pitsco program. I drive about 40,000 miles a year around the state, so a lot of the work that I do is going out to visit grantees and learn what's happening on the ground. Golden LEAF sees itself as a partner to its grantees, often pushing them to go beyond what they initially proposed and grow their work with intentionality. I don't have all the answers but do know another grantee that's gone through something similar and found a strategy that worked.

Q Do you recall what your initial takeaways were in those Pitsco labs?

A My initial takeaways came from seeing students engaged, on task, and self-directed. They had essentially taken ownership of the learning process where the teacher was serving in more of a facilitator role, coaching students to help them explore, discover, and think more deeply about the problems they were trying to solve. That was a very important observation. I saw a level of excitement from students who may not see school as their thing but through hands-on learning see the relevance of what they are learning in core subjects and how that knowledge can be applied to a work-related experience.

“Having the Pitsco curriculum align to core subjects through pacing guides has proven effective in assisting students to learn how math is a critical skill that is relevant in an occupational career – we've seen that happen with Pitsco.”

Q Why is Golden LEAF focused primarily on STEM education for Grades 4-9?

A In our infancy, Golden LEAF was primarily concerned with replacing the jobs and revenue lost from the decline in tobacco production. Our core work was focused on helping communities replace jobs and preparing adults for the workplace. After the first few years of making grants, we began to look back and think through how we needed to start developing the pipeline by working with youth to develop a pool of qualified workers. We heard about a skills gap from employers but also an interest gap from parents and students. It was not unusual to hear a parent say, “Thou shalt not pursue employment in manufacturing! I lost my job when the factory closed. You can be a doctor, a lawyer, or any other profession, but don't go into manufacturing!” And so, the interest gap was something that really caught our attention. We knew that if we were trying to influence students' decisions in high school, we needed to start early and expose students to career options in the local and regional labor markets. Through research conducted by graduate students at Duke University's Sanford School of Public Policy and some internal findings, we decided to start exposing students to STEM skills and career exploration beginning as early as the fourth grade so they could be successful in the gateway course, Math I, and to extend support on up into the ninth grade to make sure that they were successful. So that drew our initial target on skill building and career exploration for students in Grades 4-9. 



Mark Sorrells

Senior Vice President, Golden LEAF Foundation

Mark Sorrells, a senior vice president with the Golden LEAF Foundation (GLF), can personally relate to the organization's aims to seed new economic opportunities in struggling rural communities. “After graduating from high school, I was told that I needed to get out of the rural community where I grew up because there was nothing there for me. I went away to college but wound up back home operating the family business. I saw the brain drain that was happening in rural communities and knew that if there were not some real innovative ideas and dedicated resources to help stem the brain drain, many rural areas would cease to be viable places. The economic declines and dwindling populations would end up being the demise and downfall of rural life as I knew it.” Now with more than 18 years of work leading GLF's education and workforce preparedness grant initiatives, Sorrells is seeing the positive impact of investments made to rejuvenate the rural landscape of NC, particularly in the NCEast Alliance region where GLF has pumped significant resources into establishing quality STEM programs in rural schools.



Read more:
Read more of the interview with Mark Sorrells.



The NCEast Alliance is the lead economic development organization serving eastern North Carolina. The Alliance is a private, not-for-profit economic development agency serving more than one million residents within several small metropolitan and micropolitan areas from the fringe of the Research Triangle to the Atlantic Coast.