



An affiliated council of



## From the Director ...

NCATC Friends and Colleagues,

NCATC had an uber successful 2013! We certainly hope you were able to attend the 25th Anniversary Conference in Panama City, FL in October. For the first time ever at an NCATC conference, we celebrated the grand opening of the nation's newest and most exciting Advanced Technology Center at Gulf Coast State College. We capped off the three-day event with an address from Dr. Walter Bumphus, President and CEO of the American Association of Community Colleges (AACC), of which NCATC has proudly served as an Affiliated Council for the past 25 years.

NCATC works very closely with AACC, continuing to align our mission, goals, and outcomes around four of the seven recommendations of the 21st Century Commission's Report. Be sure to visit us in the exhibit area at the WDI Conference in St. Petersburg, FL in late January and at the AACC Convention in Washington, DC in April.

Please mark your calendars for our 2014 conference events. The Summer Workshop will be hosted by Central Maine Community College in Auburn, ME, June 11-13. The Fall Conference will be October 8-10 in Houston, TX where host Lone Star College will showcase its new Energy and Advanced Manufacturing Centers.

Last but not certainly not least—check out our updated website at [www.ncatc.org](http://www.ncatc.org). We continue to keep information current and fresh for our members. NCATC now boasts 27 Strategic Partners that you can learn more about under the 'Strategic Partners' tab on the website. Please feel free to send us suggestions for improvements to our website and social media sites as we evolve our communications for the benefit of our members.



I hope you have a great start to 2014 and we look forward to serving you and seeing you again at our NCATC national events later this year.

Craig

J. Craig McAtee  
NCATC Executive  
Director ♦

## The People's Fab Lab for Under \$100,000

Paul Pierpoint, Northampton Community College

By now I hope everyone associated with NCATC is well aware of the Fab Lab movement. In the eight years since the publication of Neil Gershenfeld's *FAB: The Coming Revolution on Your Desktop—From Personal Computers to Personal Fabrication*, the idea of getting low-cost advanced fabrication technologies into the hands of everyday people to unleash the entrepreneurial energy of a community has spread across the planet. Many NCATC member institutions operate Fab Labs and even more plan to have one in operation soon.



There is no one best model for Fab Labs. Some are huge with beautiful facilities, hundreds of thousands of dollars' worth of equipment, and full-time staff. Some are more like a tinkerer's garage—small, crowded, a little dingy, and inhabited by an odd array of geniuses and crackpots (which are hard to tell apart) working away on their great ideas. Most are somewhere in between.

But there is a common philosophy that underlies all Fab Labs: Everyone has the potential to create great things if they have access to the right tools and the right support—*everyone*. That means brilliant people with advanced degrees in engineering as well as 10-year-olds who like to make kites. It means the struggling artist as well as the single mother who wants to start a business in her kitchen. It means students, businesspeople, retirees, teachers, and (in at least one case) a convict serving a life sentence.

The challenge is to provide that access in an affordable but effective way. It means investing in the most useful technology—not necessarily the most advanced. It means keeping operating expenses to a minimum. And it means eliminating as many bureaucratic barriers to entry as possible so everyone can access the facility.

This is Northampton Community College's concept of the "People's Fab Lab."

When NCC first started our Fab Lab in an unrenovated section of an old Bethlehem Steel office building, we had less than 300 square feet of space, five hand-me-down computers networked to a donated Epilog Helix laser etcher/cutter, and a workbench with hand tools from a garage sale. The total college investment was about \$500. The cost for someone from the community to use our Fab Lab was about \$5 per hour.

Today we have over 2000 square feet of space, three 3D printers, a tabletop CNC router, 12 computers, a fully equipped wood shop, a full time director, a large staff of adjuncts and volunteers, and plans to expand to over 5,000 square feet in the next couple of years. Our total college investment in the facility to date is less than \$100,000. The cost to an individual to use the facility is still about \$5 per hour. (If they can't afford that, we don't turn them away.)

Frankly, we rely on the kindness and generosity of organizations and individuals who share our vision. Grants, philanthropy, and volunteers drive our model. We open our Fab Lab doors to everyone and have found that some of the people who come

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## Under Construction: New Advanced Technology Center to Offer Industry-Aligned Curriculum

To meet the growing workforce needs of Western Pennsylvania's manufacturing sector, Westmoreland County Community College (WCCC) broke ground last year for a state-of-the-art Advanced Technology Center (ATC) which will open this summer.

The \$9.4 million ATC will occupy 73,500 square feet at the Westmoreland County Regional Industrial Development Center in East Huntingdon, Pennsylvania and will house the college's expanding workforce development and advanced technology programs.



The goal is for the new Advanced Technology Center to be a regional asset and a community, workforce and economic development benefit to WCCC's critical stakeholders to

help grow the manufacturing industry in the region.

"The manufacturing and energy sectors are growing and need a workforce with technical skill sets," said Doug Jensen, WCCC Assistant Vice President for Workforce Education and Economic Development.

Manufacturing is leading the national economic recovery and in a recent survey, ranked sixth out of 10 in employment sectors in the Pittsburgh region.

The ATC will offer programs with an industry-aligned curriculum in areas such as mechatronics, advanced and additive manufacturing, energy, machining and fabrication, and metrology. An occupational advisory committee comprised of representatives from regional employers such as Kennametal, Elliott Company, and Carpenter Technology Corporation along with the National Center for Defense

Manufacturing and Machining reviewed and provided input into the ATC programs' curricula.

The ATC will house classrooms, labs outfitted with high-tech equipment, and open flexible instructional space that will allow for collaborative learning on projects.

"The ATC will provide flexibility and accessibility to students and industry partners by offering short-term, 'stackable' certificates in specific technical areas," said Jensen.

Students can complete a certificate in one semester, allowing them to enter the workforce quickly. When they need additional skills to advance in their career path, they can return to WCCC for another certificate and progress toward an associate degree.

The ATC will also be a link between the student's high school education and their career. WCCC has articulation agreements with local career and technology centers (CTCs) allowing students to receive college credit for their high school coursework when they enroll at the college. Students who also complete WCCC capstone courses during their junior and senior years will earn a college certificate in addition to their high school diploma when they graduate.

"Our stackable certificates and articulation agreements with the CTCs will give students the opportunity to customize their educational path to suit their career goals," said Jensen.

"When it opens this summer, our Advanced Technology Center will provide affordable, state-of-the-art education and training to prepare WCCC students and incumbent workers for high-demand, technically oriented careers," said WCCC President Daniel J. Obara.

"The ATC will be a regional asset for flexible, collaborative, customized job training for the area's manufacturing enterprises," Obara said, "providing an incentive for new employers to relocate to the WIDC and nearby industrial parks." ♦

## Advancing the Manufacturing Workforce through Collaboration

*Diane Dostie, Central Maine Community College*

Three projects housed at NCATC member institutions in New England address the need for highly skilled workers in the manufacturing workplace thanks to funding provided by the National Science Foundation (NSF). The Virtual Ideation Platform (VIP) and the Regional Advanced Machining Partnership (RAMP), hosted by Central Maine Community College, and the Regional Center for Next Generation Manufacturing (RCNGM), hosted by the College of Technology in Connecticut, are all projects that provide resources to educators and students interested in learning new technologies in manufacturing and program design.

The recently completed **Virtual Ideation Platform** (VIP) operated by immersing students in a virtual product design environment that enabled them to collaborate and bring product concepts and designs into pilot production. This created a model to help manufacturers compete globally with a workforce that understands and can work in a virtual environment. The VIP involved numerous academic and industrial partners working collaboratively over the Internet to design and develop products that emulated digitally enabled globalization. This was accomplished by realigning curriculum, creating infrastructure, coordinating logistics, and developing the faculty knowledge base. The VIP team created a digitally enabled product design and development platform that challenged faculty and their

students to collaborate with their peers. The essential ingredient was that stakeholders from each institution brought their particular expertise to help design and develop products.



An outgrowth of the VIP is the **Regional Advanced Machining Partnership** (RAMP) which is developing curricula for a Certificate in Advanced Machining. The Certificate will include skill sets for advanced machining theories and applications required to set-up and

run multi-axis CNC equipment. Programming, set-up, and operation of 4-axis vertical and horizontal milling centers, 5-axis vertical milling centers, and live tooling lathes as well as exposure to the advanced inspection methods that are required to inspect parts made on these machines will be included. The program will prepare students for advanced-level positions in the machining field related to multi-axis CNC.

The Connecticut Community College's College of Technology (COT) **Regional Center for Next Generation Manufacturing** (RCNGM) addresses the need for highly skilled workers in the manufacturing

*See "RCNGM," page 4*



## The “Florida Plan” and Exemplary Career Pathways for Manufacturing

Marilyn Barger, FLATE

Florida’s Department of Education (FLDOE) has focused on developing and implementing innovative state policy defining robust, rigorous, and relevant workforce career pathways. The “Florida Plan” includes state-supported pathways connecting career and technical education (CTE) programs in middle and high schools to state and community colleges with bachelor degree programs. Its mandated articulation component aligns curriculum to industry-validated credentials. This robust state CTE system provides a comprehensive structure that supports student readiness for both careers and college.



FLATE, the Florida Advanced Technological Education Center of Excellence, a National Science Foundation Advanced Technological Education (NSF ATE) Center, is housed at NCATC member institution Hillsborough Community College. FLATE

has taken advantage of Florida’s statewide CTE infrastructure to develop and implement flexible, industry-driven pathways supporting the workforce needs of Florida’s manufacturers. FLATE’s mission mirrors that of the NSF ATE program: to improve the two-year degree trained technician workforce that supports advanced manufacturing and emerging technologies. The term, “Florida Plan,” was coined by FLATE under its curriculum reform and development goal to showcase FLATE’s award-winning Engineering Technology Degree pathways together with the statewide CTE infrastructure.

FLATE began to address A.S. degree curriculum reform in 2006. Part of FLATE’s action plan was to consolidate redundant programs. FLATE identified the state’s Career and Professional Education Act (CAPE) and its alignment of secondary programs to industry credentials as something to include when building its new program. The roll-out of the Manufacturing Skills Standards Council Certified

Production Technician (MSSC-CPT), Florida’s CAPE legislation, and the definition of a technical core for the “engineering technology” (ET) degree all came together like a perfect storm.

In 2007, FLATE and its academic and industry partners rolled out the Engineering Technology A.S. degree with the ET technical core aligned to the MSSC-CPT at three colleges. In 2008, the FLATE-FLDOE partnership presented the first statewide articulation agreement proposal to the state articulating committee. The agreement guarantees that anyone holding a valid MSSC-CPT can articulate it for 15 credit hours of the ET Degree technical core. The ET core defines foundational technical skills that currently support more advanced learning in 10 second-year specializations/tracks to meet the needs of regional industry clusters. By 2009, FLATE had also developed and received state approval for a high school program (Automation and Production Technology–APT) that was specifically aligned to MSSC. FLATE began to engage and educate industry partners in the MSSC-CPT credential and the statewide articulation that provides an accelerated path for incumbent workers to receive an A.S. degree in their field of expertise.

Today, fourteen state and community colleges in Florida offer the A.S. Engineering Technology degree. There are also over 20 high schools offering APT and other MSSC-CPT aligned programs that position students to continue into an ET Degree. Additional institutions are planning to add these programs in 2014. A growing number of companies have endorsed the MSSC-CPT by making a preferred hiring credential, offering training in their facilities, or partnering with schools offering the MSSC aligned programs. These accelerated pathways built on industry-endorsed credentials are the core of the “Florida Plan.”

Since passage of the CAPE legislation there have been many innovative changes to CTE in Florida, [www.fldoe.org](http://www.fldoe.org). You can find out more about FLATE’s implementation of the “Florida Plan” and ET Degree pathways to support manufacturing education at [www.fl-ate.org](http://www.fl-ate.org). Additional details about specific college ET degree programs can be found at [www.etdegrees.org](http://www.etdegrees.org), or by contacting Dr. Marilyn Barger, [barger@fl-ate.org](mailto:barger@fl-ate.org). ♦

• “Fab Lab,” continued from page 1 •

through those doors quickly change from customer to patron to “employee.” It is amazing to see incredibly smart, successful people spend a day or two in the Fab Lab working on their own projects, then come back the next day to help a student work on her project, then come back again and again to help others. Some see that the Fab Lab needs a new tool or machine and a week or so later they bring one in and give it to us. A few become so engaged with the Fab Lab that they are willing to become nominal employees for nominal wages and provide services that the college (and more importantly, the Fab Lab customers) could never afford at market rates.

There is something inherently contagious about a Fab Lab that has virtually no barriers and is dedicated to serving everyone in a community. People want to be part of it. Successful inventors, engineers, designers, and others see it as an opportunity to give back to the community while playing with some really cool tools.

A business model that is based largely on crazy people who love to tinker and help others is not for the faint of heart. It flies in the face of what most CFOs and controllers understand about auxiliary enterprises. But when a Fab Lab truly belongs to a community, you will be amazed what the community will give back to make it succeed.

To learn more, email [ppierpoint@northampton.edu](mailto:ppierpoint@northampton.edu). ♦

## Focus on: Strategic Partner Collaboration

*Strategic Partner Alliance Member:* The Quality Group

*NCATC Member:* San Jacinto College, Greater Houston area

*Challenge:* Implement a Lean Six Sigma (LSS) training program capable of competing with area universities

*Solution:* San Jacinto (San Jac) teamed with The Quality Group to deliver a nationally recognized LSS training program with an exclusive capstone project simulation.

*Program Details:* For many academic institutions, LSS training is difficult to sell and execute well. "Lean Six Sigma is a high-end program, so not everyone can afford it," says David Lewis, Director of Business and Professions for San Jac's Continuing and Professional Development division. "And that can make it hard to sell." According to Lewis, the challenge in execution is that most LSS training programs don't provide the hands-on training necessary for customers to become well-qualified and capable candidates for LSS organizations. "In today's economy, when employers look at these job applicants, they're looking for candidates with LSS certification and project experience," says Lewis. "But because most of our customers don't come from LSS departments, they're not able to come up with a project to work on during the training."

Creative marketing efforts and a wide variety of information sessions enabled the San Jac team to demonstrate the quality of the program to potential clients. "A lot of people are afraid of going online, but once they see how well TQG has designed the online modules, and they see the capstone product, the rest of the program sells itself." San Jac currently runs up to six LSS classes at a time and plans to continue adding more to accommodate customer demand. The program has exceeded expectations, with more than 150 students registered in the first eight months.

For more information, contact Carol Dierdorff, [CDierdorff@thequalitygroup.net](mailto:CDierdorff@thequalitygroup.net) ♦



• "RCNGM," continued from page 2 •

workplace by constructing programs that provide resources to educators and students interested in learning new technologies in manufacturing. The RCNGM is administered by the CT College of Technology, a collaboration of all 12 community colleges with eight universities, industry, and high schools and has created a seamless pathway with no barriers or loss of earned credits for students transitioning from a two-year college to a four-year program at partnering colleges and universities within the state of Connecticut. The COT also was able to develop articulation agreements with the state's technical high schools which created a pathway for students to transition to any one of Connecticut's community colleges. In addition, the RCNGM has collaborated with the Connecticut Business and Industry Association (CBIA), the Center's major industry partner in developing marketing campaigns, curriculum, and industry surveys to address the workforce needs in manufacturing throughout the region.

The RCNGM is in its 10th year of operation and was awarded a third round of funding in 2012. The RCNGM is expanding its promising practices with community colleges and their industry partners in Maine, New Hampshire, Massachusetts, and Vermont. The regional outreach activities will address the recruitment of underrepresented students for careers in manufacturing, professional development workshops for counselors and teachers, as well as expos with follow-up initiatives for high school students.

The need to design, create, and then strengthen partnerships between the educational community and business and industry was a logical step in promoting the necessary training to address the need for more highly skilled workers in the tumultuous manufacturing environment. The partnerships between these NCATC member institutions are addressing the challenges of educating the manufacturing workforce needed for the 21<sup>st</sup> century. For more information, contact Diane Dostie at Central Maine Community College, [ddostie@cmcc.edu](mailto:ddostie@cmcc.edu), or Karen Wosczyzna-Birch at Connecticut's College of Technology, [wosczyzna-birch@ct.edu](mailto:wosczyzna-birch@ct.edu). ♦

## Welcome, New Board Members



L to R: **Karen Wosczyzna-Birch**, Principal Investigator and Executive Director, Regional Center for Next Generation Manufacturing, Connecticut College of Technology; **Don Robison**, Director, Corporate Services, St. Louis Community College; **Nick Graff**, Director, Advanced Technology Center, Anoka Technical College



## Welcome, New Members

The NCATC Membership Committee is pleased to announce the addition of these new member organizations since our last newsletter was published.

### Full Centers

Fox Valley Technical College (WI)  
San Jacinto College (TX) • Central Virginia CC (VA) • New River CC (VA) • Patrick Henry CC (VA)  
Southside Virginia CC (VA)  
Virginia Western CC (VA)  
Germanna CC (VA)

### Associate Members

Chippewa Valley Technical College (WI) • South Central College (MN)  
St. Charles CC (MO) • North Dakota State College of Science (ND) • Chipola College (FL)

### Affiliate Members

Maui CC (HI) • Kauai CC (HI)  
Hawaii CC (HI) • Kapiolani CC (HI)  
Leeward CC (HI) • Windward CC (HI)

### Strategic Partners

Fabricators & Manufacturer's Assn., International (IL)  
Community College Workforce Alliance (VA) • FANUC (MI)  
IntelliTek (NH) • Interview Stream (TX)

Contact information for each member institution is located in the Members section of the NCATC web site. Membership applications are found under the "Member Benefit/Join" tab.

To contact NCATC, please call or email us at:

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