NCATC National Coalition of Advanced Technology Centers
Celebrating 30 Years of Advanced Technology Expertise
1988–2018

An affiliated council of AMERICAN ASSOCIATION OF COMMUNITY COLLEGES

From the Director ...

NCATC Friends and Colleagues,

The inspiration for this column comes from my in-depth review of documents from the last thirty years produced by, for, and about the National Coalition of Advanced Technology Centers. In particular, the first decade (1988–1998) titled, "A Decade of Technology and Workforce Modernization," compiled and written by my predecessor, mentor, and very good friend – Dr. Richard (Dick) Hinckley.

Today, as we celebrate our thirtieth anniversary, *The Coalition* continues to be a dynamic organization comprising over 170-member institutions that include over 30 corporate Strategic Partners. NCATC has held 60 conferences / workshops, has been involved in many major grants, and continues to help shape colleges through replicable examples of successful ATC facilities, programs, and real partnerships with the industries we serve.

Our "founding fathers," Dan Hull, then President of CORD, and Carroll Marsalis, retired Tennessee Valley Authority executive, were genuinely concerned with the loss of industrial strength in the U.S. and the need for much more advanced technology and manufacturing related training at two-year colleges. As they forged their vision, they met with key community college leaders, including Nolan Ellison and Michael Taggart of Cuyahoga Community College (OH) and Walter Edling of Lorain County Community College (OH) to form the nucleus of NCATC in 1987. Dan also began working with Dale Parnell, then President of AACJC (now AACC) on 2+2 articulation concepts that led to the beginning of Tech Prep, and just this week the overdue reauthorization of H.R. 2353 Perkins CTE Funding for $1.2B x 6 years was signed into law.

Fast forward to 2018 and so much has changed in advanced technology and manufacturing...or has it?! Yes, the technologies that drive us are now in the fourth industrial revolution. Digital manufacturing, robotics, and Industry 4.0 are all around us. However, the need to attract, train, and place the right workforce in the right advanced technology career has never been more needed. Not even in 1988!

So, it's "back to the future" as we celebrate 30 years with one of our top Strategic Focus Areas, *Industry 4.0: Emerging Trends in Advanced Technology and Smart Manufacturing.* We have partnered with **AACC** and the **Arconic Foundation** to help improve the content and processes for education and training—and identify promising practices—in advanced technology and manufacturing for the incumbent and future workforce pipelines in the U.S. This program will provide technical assistance to the cohort in diverse areas such as *Cybersecurity, Simulation, System Integration, Big Data Analytics, Artificial Intelligence, Industrial Internet-Of-Things (IIOT), Additive Manufacturing, Advanced Robotics,* etc. For more details, see the AACC press Release here.

The NCATC Board of Directors and staff look forward to seeing you at the **30th Anniversary NCATC Conference**, **September 19-21, 2018,** when we return to the home of two founding member colleges, **Cuyahoga Community College (Tri-C)** and **Lorain County Community College (LCCC)**, in **Cleveland, OH**!

For more event details, visit ncatc.org.

As always, we encourage you to stay regularly connected, via the NCATC website, social media, and quarterly e-newsletters like this one.

J. Craig McAtee, NCATC Executive Director

The Winds of Change: Midlands Technical College Launches Program in Renewable Energy

Four years ago South Carolina passed legislation that created a pathway for growth in the renewable energy industry. With this change in South Carolina law, the demand for photovoltaic installers has increased. Thus far, much of the installation service has been provided by out-of-state contractors. In response, Midlands Technical College (MTC) in Columbia, SC, recently launched a program to provide entry-level training in renewable energy solutions.

"Renewable energy sources such as photovoltaic and wind turbines are becoming more prevalent in the generation of electrical energy," said Alan Clayton, MTC's Department Chair of Industrial Technologies. "More than ever, it has become important for our community to have a trained workforce familiar with theory, installation, troubleshooting, and maintenance of renewable energy systems."

"Graduates of the program have the potential to secure entry-level positions in the photovoltaic installation and maintenance field as well as with other electrical and renewable energy contractors and maintainers," said MTC instructor Stanley Oswald. "As the prevalence of photovoltaics and renewable energy increases, so will the demand for entry-level trained personnel in this expanding field."

"Photovoltaic systems are not a passing fad used by just some households and organizations," said Clayton. "There is a growing market and demand for photovoltaic systems in South Carolina."

Employers who use renewable energy in their organizations, both public and private, welcome the new program.

"The implementation of a renewable energy program at MTC is a great idea," said Michael Clem, an electrical operations supervisor for the City of Columbia. "We are starting to see more of this technology being used in traffic control equipment and in security lighting. I believe that instruction for

See "MTC," page 3.

California Community College Makerspaces Publish Startup Guide

Makerspace Startup Guide helps colleges, schools, and communities provide in-demand skills.

The CCC Maker initiative has just published *The California Community College Makerspace Startup Guide: Preparing Students for Jobs of the Future.* The purpose of the guide is to share the planning process used to guide college teams through building makerspace communities that complement what college students are learning in the classroom to better prepare them for the innovation economy. The guide is available for download free of charge at the CCC Maker website (https://cccmaker.com/).

In mid-2016 California Community Colleges embarked on a journey to create makerspace communities affiliated with colleges funded by a grant from the California Community College Chancellors Office under the Doing What MATTERS for Jobs and the Economy (http://doingwhatmatters.cccco.edu/) framework. Sierra College is the administrator and fiscal agent.

According to Dale Dougherty, CEO of Maker Media and chair of the CCC Maker advisory committee, community colleges are in the unique position to democratize making by giving students in the largest and most diverse education system in the country access to makerspaces. "Students develop the ability to learn, adapt, and change when they join a maker community," said Dougherty. "As students create projects that reflect their interests and abilities, and share it with students from other disciplines such as art, engineering, or business, it can change the nature of their lives. They gain a sense of agency to learn, earn, and live a good life." *The California Community College Makerspace Startup Guide* is intended to help other colleges make these same opportunities available to their students.

The $17 million grant provided by the California Community College Chancellors Office has enabled colleges to plan and develop makerspace communities that reflect each college's unique ecosystem, explained Carol Pepper-Kittredge, Statewide Project Director, CCC Maker, and Associate Dean of Workforce Innovation at Sierra College. "During the startup phase, we were not prescriptive," she explained. "Rather than focusing on the physical space and tools, we developed a makerspace startup process that encouraged colleges to explore opportunities to create and connect by building community. *The California Community College Makerspace Startup Guide* reflects the methodology CCC Maker developed to support colleges in planning makerspaces that are student-centric and fit with their culture and ecosystem."

The guide provides strategies for developing a makerspace implementation action plan by identifying community needs, mapping out ecosystems, analyzing findings, and piloting student and faculty engagement. The CCC Maker initiative focused on four areas for implementation—community, curriculum, internships, and makerspace—so the guide outlines how college makerspace plans can gain traction in these areas. The 80-page publication also shares the guiding principles that shaped the CCC Maker approach.

The guide includes chapters on institutional self-study, ecosystem mapping, logic modeling, community outreach, internships, makerspace design, and facilitators. To share the CCC Maker startup process with the wider maker community, author Goli Mohammadi interviewed the CCC Maker technical assistance providers Deborah Bird and Salomon Davila, as well as the other members of the CCC Maker leadership team and Maker Ed, to consolidate the resources developed and capture what was learned during the planning phase.

CALIFORNIA COMMUNITY COLLEGES
ccc maker
explore . create . connect

Of the 34 colleges that signed on to participate in the startup process, 28 developed detailed plans and 24 received CCC Maker implementation funding through May 2019. Those colleges just reported their third quarter results for the first nine months of implementation. Those result are viewable on the CCC Maker website (https://cccmaker.com/).

The true measure of the CCC Maker initiative's success is student impact. California Community College makerspaces are affording students opportunities to discover their passion, develop their potential, and recognize the valuable innovation skills and entrepreneurial mindset that they can contribute to California's economy as they launch their careers.

Kimberly Glaster, a Sacramento City College student, indicated that one of the greatest benefits that a makerspace offers to students is the opportunity to gain real-world experience in a community environment. "Students from all backgrounds can come to one location to work together as a team to create an idea or thought into something tangible," said Glaster.

A college makerspace can serve as a central place on campus attracting students from a variety of disciplines, according to Sacramento City College student Pouyan Kiani. "A makerspace can act as a hub where students can grow intellectually by learning different skills and collaborating with other people," she said. "Most of these skills are not taught in classrooms, so the makerspace offers a unique dimension to a student's education."

Download the guide, check out other resources and learn more about the 24 California Community Colleges participating in the CCC Maker initiative at the CCC Maker website (https://cccmaker.com/).

About Sierra College

The Sierra College District serves 3200 square miles of Northern California with campuses in Roseville, Rocklin, Grass Valley, and Truckee. With approximately 125 degree and certificate programs, Sierra College is ranked first in Northern California (Sacramento north) for transfers to four-year colleges and universities. Sierra offers career/technical training and classes for upgrading job skills. Sierra graduates can be found in businesses and industries throughout the region. For more information, visit www.sierracollege.edu.

SIERRA COLLEGE

FLATE's MSSC Workshop Highlights the New CPT+ Credential

Marilyn Barger, Principal Investigator, FLATE

Florida educators interested in manufacturing education recently attended a 1½-day FLATE workshop about new aspects of the Manufacturing Skills Standards Council Certified Production Technician (MSSC-CPT) credential. A packed agenda was centered around the updated standards from an MSSC panel of experts for the CPT as well as a new hands-on tool designed to support MSSC student learning, "Skills Boss." This integrated small trainer was developed to provide hands-on activities that support the MSSC workplace standards. The Skills Boss will be especially helpful for those who have little or no experience in the manufacturing workplace, including high school students.

The workshop included six hours of hands-on activities led by D.C. Jaeger and Amatrol personnel working at 4 Skills Boss stations on exercises that support each of the four MSSC assessments. An industry panel of employers detailed how some companies use the MSSC-CPT; their need for a skilled, knowledgeable workforce; and how they partner with colleges and schools. Ken Jones from the Hillsborough County Manufacturing Alliance, James Moore from CardioCommand (medical devices), and Mercedes Heredia from Mitek (steel plates for construction) made up the diverse panel. An opening panel of educators who have been using the MSSC-CPT for a few years discussed how they integrated the CPT into their programs of study, the grade levels at which students took each of the four assessments, and the importance and challenges of including hands-on activities, particularly to support high school students.

Leo Reddy, MSSC chairman and CEO, addressed the attendees, providing information about MSSC's new preapprenticeship program and the upcoming CPT+ credential, which will include hands-on skills as part of the overall assessment. MSSC implementation of this new credential will begin within the next six months. Reddy also spent time listening to the high school MSSC educators to learn more about their working environments and the students they have in their classrooms. Ted Norman, former State Supervisor of Manufacturing and current FLDOE Director of Apprenticeship, Adult and Career Education, provided updates from the Florida Department of Education (FLDOE) and how the state curriculum frameworks provide smooth pathways from middle school to high school and aligned postsecondary programs.

FLATE could not provide a workshop like this without help from its partners. Participating sponsors included MSSC and D.C. Jaeger for meals; D.C. Jaeger, Amatrol, and HCC for equipment and workshop materials and instruction; and FACTE (Florida Association of Career and Technical Education) for educator participant travel. Thanks also to our speakers, Leo Reddy (MSSC) and Ted Norman (FLDOE), and to our industry and educator panelists for taking time to share their experiences. Over thirty manufacturing educators from around the state participated and found the workshop to be of great professional development value. Over 95 percent of attendees agreed that the all aspects of the workshop were very good or excellent. Evaluations included comments such as "Excellent workshop!" and "We are looking at starting the CPT program. This was excellent information for us."

For more information, visit the MSSC website (https://www.msscusa.org/) or the D.C. Jaeger site (https://www.dcjaegercorporation.com/). To learn more about FLATE and its educational resources, visit the FLATE website (http://fl-ate.org/), sign up for the monthly FLATE Focus Newsletter, or contact Dr. Marilyn Barger, FLATE Executive Director, at barger@fl-ate.org. Resources and presentations from the workshop will be posted on FLATE's wiki. ◆

• *"MTC," continued from page 1* •

proper installation and maintenance will be of great benefit to all."

"I personally like the course format for the Renewable Energy Technician Certificate," said Allen Pollard, senior project manager at A&R Power and Controls. "Energy companies are heading in the direction of using more clean energy."

"The ideal candidate for this program has good math skills, enjoys working with their hands, and doing a variety of activities," said Clayton. "There is certainly a potential for self-employment if someone has the desire to be an entrepreneur, but the job market is quite healthy and will probably be growing for the foreseeable future."

The certificate is designed to be completed in two semesters. Students take courses in AC/DC fundamentals, safety, blueprint reading, National Electrical Code, and residential and commercial wiring. Students also have 10 semester hours dedicated to the study of solar fundamentals and applications. This is a stand-alone certificate. Students who complete it are immediately employable.

Program graduates will be able to install, service, and troubleshoot renewable energy systems, including solar and wind. Installations may be roof or ground mounted and may be fixed or variable to follow the trajectory of the sun. These technicians will also have the skills to service backup battery systems and will be able to install, service, and replace the systems.

"Our overall goal is to develop a trained workforce capable of installing solar energy appliances and equipment," said Clayton. "This supports the college's mission of developing students ready to enter the job market, build a workforce, and strengthen the economic development in the Midlands area and South Carolina as a whole."

Contact Alan Clayton at claytona@midlandstech.edu. ◆

Preparing the Next Generation of the Manufacturing Workforce

Marc Goldberg, Associate VP of Workforce Development and Community Education, PCC

Portland Community College (www.pcc.edu), Oregon's largest post-secondary institution, is helping to lead an exciting new statewide advanced manufacturing collaborative—the Oregon Manufacturing Innovation Center in Scappoose, Oregon. Modeled after the Advanced Manufacturing Research Centre (http://www.amrc.co.uk/) in England, OMIC represents a collaboration of industry, higher education, and government that seeks to combine applied research and development and workforce training in metals manufacturing, within a world-class innovation center. This collaboration will serve advanced manufacturers in the region while giving area residents access to living-wage careers in a growing industry sector.

The manufacturing sector is a key driver of Oregon's economy. According to the National Association of Manufacturers, manufacturing represents 21.8 percent of the state's total output, ranking Oregon as the second most dependent state in the nation on this industry (NAM State Manufacturing Data). In 2017, Oregon was home to nearly 6,200 manufacturing establishments, representing 189,000 jobs—more than 10 percent of the state's employment (State of Oregon Employment Department). This is projected to grow. Between 2014 and 2024, an uptick of 11.8 percent (62,000 job openings) is predicted (ibid.).

"OMIC will be a huge economic development driver for the state with its prospect for new jobs and businesses," said Senator Betsy Johnson, whose district includes Scappoose. "It will help to build a pipeline of talent for regional manufacturers."

While this sector's wages are well above the state average, its demographics jeopardize the industry's long-term viability. Compared to other industries in the state, a relatively large percentage of Oregon's manufacturing workers are age 55 or older. For this reason, all nine local workforce development boards have made manufacturing a priority in their regions.

PCC is charged with building the training center as part of OMIC, to house programs in computer numerically controlled (CNC) operation, machining, welding, and mechatronics. Its programs will be based on an apprenticeship model that will enable students to complete associate degrees or certificates leading to advanced degrees. PCC's training center complements OMIC's applied research and development division (http://www.omic.us/), whose R&D projects are led by industry partners; university faculty from the Oregon Institute of Technology, Portland State University, and Oregon State University; and student interns.

Over the past year, PCC has met with more than 75 manufacturers to identify their most critical workforce needs. The college also has helped industry partners form a joint apprenticeship training committee (JATC), which identified three priority occupations for registered apprenticeships: machinist, industrial fabricator, and mechatronics technician. JATC members are establishing standards for these occupations to align with nationally recognized credentials such as NIMS. Such collaboration positions OMIC to scale across the state, enabling manufacturers to work with their local community colleges and map curriculum to the same national standards.

Meanwhile, OMIC apprenticeships will be developed within a pathways framework. PCC received a grant from the Oregon Department of Labor to develop new apprenticeships in the coming year. The first, for machinists, was just approved by the state apprenticeship board. Simultaneously, PCC has been partnering with school districts to align secondary curriculum and prepare high school students for apprenticeships with dual credit opportunities. PCC's training center is expected to open in fall 2020. Until then, the college has invested in manufacturing equipment and will launch apprenticeship courses in temporary space at Scappoose High School beginning in fall 2018.

PCC's university OMIC partners are fostering educational pathways that would lead from apprentices to journeyed credentials, associate degrees at PCC, and eventually to university degrees. This will create opportunities for OMIC apprentices to participate in industry research projects while completing their training at PCC.

Finally, PCC will partner with community-based organizations and public workforce development partners (WIOA and Department of Human Services) to create access to OMIC apprenticeships for adult job seekers—particularly underrepresented populations.

Despite OMIC's large scope, the initiative's many partners have a shared focus—to keep local manufacturing competitive globally.

"OMIC offers the opportunity to educate the next generation of the workforce as we simultaneously meet employers' needs in industries that are growing and offer significant advancement potential," said PCC President Mark Mitsui.

Contact Marc Goldberg at marc.goldberg1@pcc.edu. ◆

NCATC 30

30th ANNIVERSARY FALL CONFERENCE

Sept 19–21, 2018 • Cleveland, OH

Celebrating 30 Years of Advanced Technology Expertise

Cuyahoga Community College

Lorain County Community College

AT THE NEXUS OF WORKFORCE DEVELOPMENT & TECHNOLOGY

Celebrating 30 Years

As we celebrate our 30th anniversary, NCATC member institutions continue to be uniquely positioned as vehicles for change in workforce development in their respective communities.

Join NCATC colleagues and founding members Cuyahoga Community College and Lorain County Community College in Cleveland for a three-day exchange of innovative ideas and promising practices around NCATC's strategic focus areas:

- Industry 4.0: Emerging Trends in Advanced Technology and Smart Manufacturing
- Apprenticeships, Work-Based Learning, and Entrepreneurship in Workforce Development
- Competency-Based Learning in Workforce Development
- Industry-Recognized Credentials and Certifications
- Adult Education and Learning Opportunities

Industry Tours

- think[box] @ Case Western Reserve University
- Welding Technology & Training Center @ Lincoln Electric
- Medical Device Solutions Labs @ Cleveland Clinic
- Global Center for Health Innovation

Advanced Technology Center Tours

Cuyahoga Community College

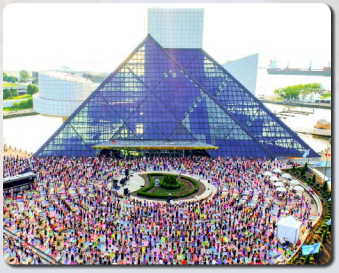
- Mechatronics, Automation/Industry 4.0
- Idea Station/Fab Lab/3D-Additive Mfg.
- Creative Arts - STEAM Labs

Lorain County Community College

- Micro-electrical/Mechatronics Lab
- Digital Mfg./Automation Labs
- Fab Lab/Maker Space/3D- Additive Mfg.
- Mobile Welding Lab

Concurrent Sessions

Presented by community college workforce professionals in collaborative partnerships with industry partners like Haas Automation, Festo, Siemens, NIMS, Tooling U-SME, MfgUSA Institutes, NIST-MEP, KYFAME, NTMA, and OpusWorks, concurrent sessions will cover topics such as the future of work, industry-led apprenticeships, industry-credentials, Industry 4.0 and the Industrial Internet of Things (IIoT), cybersecurity, additive manufacturing, robotics, artificial intelligence, the manufacturing classroom of the future, *and much more!*



Our Host City

Cleveland, a vibrant lakeside city, is world-renowned for its arts and cultural institutions, the nation's second-largest performing arts district, the Rock and Roll Hall of Fame, and a nationally recognized culinary scene. Learn more at www.thisiscleveland.com.

Conference Hotel

Hilton Cleveland is in the heart of Cleveland's vibrant downtown area. Popular attractions, dining, and entertainment are minutes away. NCATC special conference rate: $189 per night. Register online or call 216.413.5000.

30th Anniversary. Cleveland. Don't Miss It.

Share the conference flyer.

www.ncatc.org