

2020 HI-TEC Poster Sessions

BETA Skills: The Skillset for the Future Tissue Engineering and Biomedical Devices Tech

BETA Skills is a diverse, multi-stakeholder project that is defining the future technical skills that will be used in producing biomedical devices that overlap with the marvels of tissue engineering. What do companies working in this milieu expect their technicians to be able to do at a competitive level? By working with industry, educators, and workforce experts, we have defined the most probable skillsets that will be required for entry-level technicians in this converging area.

Russ Read, National Center Biotechworkforce of ForsythTech, Winston Salem, NC

Integrating Project-Based Learning in a Biotechnology Lab

Project-based learning (PBL) has become increasingly useful in science labs as a means to improving and measuring students' critical thinking skills, self-confidence, and project management skills and enabling students to demonstrate the application of knowledge and skills acquired in the classroom. In the spring 2019 semester, thirteen students in the biotechnology laboratory at Los Angeles Mission College were asked to develop and complete projects of their interest and then present at a poster exhibition that was open to all students, faculty, staff, high schools, and the biotechnology advisory board members. The topics of four projects chosen were: 1) Every Lost Drop pH₂O, 2) Silver Nanoparticles: The Magic of Super Silver, 3) Kombucha Conundrum: Communi-tea of Bacterial and Yeast, and 4) Purifying Glow in the Dark Protein Using Upstream and Downstream Process. Small teams of students developed hypotheses, designed projects, and conducted experiments.

Chander Arora, Los Angeles Mission College, Sylmar, CA

Improving the Effectiveness and Accessibility of Technical Courses Through a Competency-Based Hybrid Model

This session will begin with an overview of the NSF project "HOME4TECH," in which Northwest State Community College developed a competency-based/hybrid instructional model and converted fifteen industrial technology courses to the model. Then, transitioning to the new ATE project on how to scale elements of this model into advanced manufacturing courses, the presenters will show how colleges can improve the effectiveness of and access to their technical courses. Topics will include alignment of curriculum to industry, assessment models, transitioning to online teaching, creating videos and other active learning objects, obtaining and implementing open educational resource (OER) material, and creating virtual simulations.

Thomas Wylie, Sarah Stubblefield, Northwest State Community College, Archbold, OH

ACM's New Cybersecurity and Information Technology Curricular Guidance for Two-Year Degree Programs

The ACM Committee for Computing Education in Community Colleges (CCECC) has recently released curricular guidance for associate degree programs in cybersecurity and information technology. This poster session will feature an overview of the curriculum content along with insights into its application in two-year programs and its alignment with broadly accepted frameworks such as the NICE Cybersecurity Workforce Framework and the ACM IT2017 guidelines.

Cara Tang, ACM CCECC and Portland Community College, Portland, OR; **Markus Geissler**, ACM CCECC and Cosumnes River College, Sacramento, CA

Just-in-Time Remediation for Early College and AAS Students

This poster relates to remediation for students whose insufficient backgrounds in science and mathematics often cause low grades, low course retention, and low rates of degree completion. This approach provides remediation in science and mathematics at every point during the semester. At Forsyth Tech, this remediation is being accomplished in two ways. First, Early College students are offered additional opportunities to meet with faculty outside of class to review materials and introduce and reinforce difficult concepts. Second, remediation content is built into the curriculum of an AAS program.

Dwaine Davis, Forsyth Tech Community College, Winston-Salem, NC

TSTC Online Competency-Based Education Project

The Texas State Technical College Online Competency-Based Education Project is a “small, new to ATE” project that proposes to develop online competency-based programs for technicians pursuing careers in architectural design, engineering graphics technology (CAD), and cybersecurity. The project will involve updating existing curricula to respond to current industry demands, providing professional development for faculty, providing mentoring and support services for students, developing handbooks for faculty who are teaching the courses, developing an online CBE model for other CTE fields and institutions, and improving job placement opportunities so graduates are placed promptly and appropriately.

Amy Hertel, Sam Pizano, Texas State Technical College, Marshall, TX

Formative Assessment Systems for ATE 2

Do you need to capture data on the effectiveness of your professional development program? We can help. The goal of Formative Assessment Systems for ATE 2 is to refine, test, validate, and disseminate a set of assessment tools that you can use to collect data on the effectiveness of your professional development activities, particularly student-level assessment data. This poster will present information about formative assessment, the “toolkit” under development, and ways you can begin using these tools right now.

Robin Datta, Edmonds Community College, Lynn, WA; **Amy Gullickson, Mia Chen**, Centre for Program Evaluation, Melbourne Graduate School of Education, Melbourne, Australia

Addressing the Global Nature of Industry

Faculty and students from Northwestern Connecticut Community College traveled to Spain to learn how manufacturers are working with technical schools to produce a technical workforce. The group visited a technical school and a university along with four manufacturers and a data science company. This poster will describe the interactions and lessons learned. The impact on the students and faculty will be presented. Prior to the visit, students participated in a semester-long virtual international exchange with students from the University of CompuLense, Madrid. The structure and impact of that exchange will also be addressed.

Sharon Gusky, Tommy Le, Kit Fitch, Northwestern Connecticut Community College, Winsted, CT

Bioscience Technician Expansion Project Year Two

The second year of the Bioscience Technician Expansion Project (NSF grant #1800850) has brought new insights to the development of transfer pathways to four-year colleges and universities and outreach opportunities. This poster will highlight our work on transfer agreements with Ashland University and the University of Findlay. The PI and Co-PI have engaged in several outreach initiatives in both the private and public sectors. These will be explored in the presentation.

Justin Tickhill, Jason Tucker, North Central State College, Mansfield, OH

Hands-on Technician Training (HoTT) at South Arkansas Community College

South Arkansas Community College is redesigning three foundational advanced manufacturing courses in process technology and industrial technology and will offer them in a hybrid format. These courses will be part of a new one-semester certificate of proficiency that leads to entry-level jobs or can be the foundation upon which students pursue additional coursework. The courses will incorporate competency-based learning outcomes and open labs with industry-specified hands-on activities and assessments. The project addresses industry's need for higher-skilled technicians.

David Carty, Ray Winiecki, South Arkansas Community College, El Dorado, AR

Clean Tech ATE: Advancing Technician Training in Clean Energy Technology

Shoreline Community College has upgraded its clean energy technology curriculum and added long-term project-based learning experiences that develop higher levels of software and engineering skills. By developing a curriculum that addresses industry-identified needs and contains job-specific experiences, the revitalized program helps students develop a skillset that prepares them for high-skill technology jobs in the field of clean energy. Currently, there is no national title for a clean energy technician. However, Shoreline's industry advisory board identified a need for such a position, and this project developed skill standards that align with industry needs. The results of the project expedited Shoreline graduates' placement into energy management jobs and contributed new materials to the NSF ATE community.

Louise Petruzzella, Shoreline Community College, Shoreline, WA

Rustproof: Corrosion Tech for Sustainable Careers, Environmental Protection, and Industry Innovation

If you have driven over a bridge, turned on your tap for a drink of water, or heated your home with natural gas, you rely on corrosion protection. With an estimated \$1.3 trillion in corrosion-related infrastructure problems, the U.S. is facing a serious challenge. Yet an aging workforce and new technologies have left many industries shorthanded. The employment opportunities in this critical field are tremendous, opening the door to first-generation students and other populations that have previously watched the prosperity engines of energy from the sidelines. Through its innovative Blendflex course delivery, SCCC is opening nationwide access to workforce education in this high-demand field.

Autry Coleman, Charity Horinek, Rachel Coleman, Jim Hyder, Seward County Community College, Liberal, KS

Advanced Manufacturing and Automation Flexible Delivery

With the arrival of manufacturers such as Tesla and Panasonic, the Reno area has a growing need for competent technicians in advanced manufacturing and automation flexible delivery. To generate the workforce necessary to meet this need, Truckee Meadows Community College (TMCC) created easy-to-use, flexible courses that appeal to incumbent technicians, lower-skilled workers, and students with nontraditional schedules. These courses include hybrid segments of our three-credit classes that allow students to take one or two segments at a time. These segments are open entry, closed exit classes with flexible lab times that are stackable toward a BAS degree.

Randal Walden, Truckee Meadows Community College, Reno, Nevada

Cybersecurity for Advanced Manufacturing Organizations

This session will describe the planning and early implementation strategy used to develop virtual training scenarios designed to increase cybersecurity preparedness for advanced manufacturing organizations. The session will describe the scenarios' function within a "Cybersecurity Range" that can be utilized by private companies, educational institutions, the military, and individuals throughout the state.

Tony Hills, Northwest State Community College, Archbold, OH

Assessing Educational Pathways for Manufacturing in NW Florida: Early Findings and Implications

Building on prior research on career pathways in information technologies (IT), this NSF ATE targeted research project investigates the alignment of curriculum, employer needs, and new employee experience in advanced manufacturing (AM) and tests the usefulness of tools and processes developed to assess that alignment in rural institutions. The presenters will share refined data analysis strategies, exciting research results to date, and directions for future work. This work is centered on rural communities and has implications for economic development and community vitality in those locales.

Marcis Mardis, Florida State University, Tallahassee, FL; **David Bouvin**, Chipola College, Marianna, FL

Integrated Wind and Wave Power Systems Comprising State-of-the-Art Linear and Rotary Generators

In this project students from multiple disciplines will collaborate in building a state-of-the-art integrated wind and wave power laboratory. The laboratory will have an ocean-like ecosystem with wind and wave simulations. A student-designed, student-built generator will be implemented and observed for over a year. Highly efficient linear and rotary generators will be integrated into the system along with a rectifier, energy storage, and more. The laboratory will be used by undergraduate and graduate students for research on wind and wave power systems.

Natalie Garnder, Project Wave, Alsea, OR; **Noah Sharrott**, Oregon Institute of Technology, Klamath Falls, OR

Implementing a Two-Year Data Science Degree

This poster will describe challenges and strategies associated with an AS degree in data science. Topics will include industry engagement, curriculum development, and student recruitment.

David Singletary, **Pamela Brauda**, **Ernie Friend**, Florida State College, Jacksonville, FL

Multidisciplinary Simulation: Advanced Manufacturing and Transportation, Distribution, and Logistics

This project aims to prepare TDL and advanced manufacturing students for a changing workplace by exposing them to emerging technologies in a multidisciplinary work environment. This integration is designed to provide students with technical skills and discipline-specific knowledge as well as an understanding of the business side of manufacturing.

Debra Jones, Orangeburg-Calhoun Technical College, Orangeburg, SC

Converting from a Linear Workflow to a Nonlinear Workflow in CTE Curriculum Development

This session will elaborate on the enrichment of CTE curriculum development through the collaborative conversion of a linear process to a nonlinear process. This process will allow all stakeholders involved to have access to the relevant documents regarding state licensing, program content, national certifications, and student learning outcomes.

LaToya Sterling, Mark Jenkins, Mississippi Community College Board, Jackson, MS

Convergence Technology Students Present New Perspectives and Projects

Student representatives from schools in the CTC's nationwide Convergence College Network (CCN) community of practice will provide an overview of recent research, learning projects, and career opportunities in the information communications technology space.

Mark Dempsey, Collin College, Frisco, TX

Partnering with Manufacturing USA Institutes

Learn how the Next Generation Manufacturing Center has partnered with Manufacturing USA Institutes. Created to foster partnerships among industry, education, government, and other stakeholders in advanced manufacturing technology, Manufacturing USA Institutes are valuable partners for community colleges. With technological innovation and workforce development as key objectives of the institutes, NSF ATE grantees can benefit from participating in the initiatives of the institutes. The session will share information on how NSF ATE grantees can partner with Manufacturing USA Institutes.

Karen Wosczyzna-Birch, Wendy Robicheau, Connecticut College of Technology, Farmington, CT; **John Birch**, The Birch Group, Farmington, CT; **Eric Flynn**, Gateway Community College, New Haven, CT