

ADVANCED MANUFACTURING PROBLEM-BASED LEARNING

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NEWS

A PROJECT OF THE NEW ENGLAND BOARD OF HIGHER EDUCATION (NEBHE)

Located in Boston, Mass.

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www.pblprojects.org

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NEW ENGLAND
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Welcome, AM PBL Participating Instructors!

The New England Board of Higher Education's (NEBHE) Advanced Manufacturing Problem Based Learning (AM PBL) project team looks forward to welcoming secondary and postsecondary STEM educators and STEM teacher education faculty members to the project during the spring and summer of 2014.

The project team is pleased to have accepted 26 secondary and postsecondary STEM educators and six teacher education faculty members from a qualified pool of 55 applicants. Accepted participants hail from each of the six New England states and represent science, technology, engineering and mathematics (STEM) disciplines at middle schools, high schools, community colleges and four-year universities. A waiting list is being maintained should an opening occur.

Participants of the AM PBL project, which is funded by the National Science Foundation's Advanced Technological Education (NSF ATE) program, were recruited for two groups: a cohort of secondary and postsecondary STEM educators, and a cohort of STEM teacher education faculty members who are implementing teacher preparation courses. Recruitment was conducted via outreach to association listservs, state-level secondary and postsecondary contacts, leads from AM PBL Advisory Committee members and NEBHE board members and contacts, as well as project dissemination activities such as workshops and presentations. Efforts were made to reach out to underserved populations. The project leaders hosted 14 outreach and dissemination workshops in New England. Nearly one third of accepted participants attended PBL dissemination workshops. The project has accepted

[Educator Recruitment continued on page 3](#)

AM PBL Partners with Advanced Manufacturing Companies in New England

In November 2013, the AM PBL project team travelled to two New England advanced manufacturing companies to develop two new multimedia real world instructional modules called Challenges. The first trip was to East Longmeadow, Mass., to work with CIRTEC Medical Systems. CIRTEC is a leading contract medical device manufacturer with facilities in Massachusetts and California. The company specializes in minimally invasive devices, active and passive implants and medical electronics systems.



AM PBL Challenge partner Heather Dunn, director of special programs at CIRTEC Medical Systems, led the AM PBL project team on a tour of CIRTEC's manufacturing facility in East Longmeadow, Mass.

Advances in medical therapies require increasingly advanced and novel instruments and devices. Skilled employees are

needed to conduct research, engineer, design, test and produce these advanced devices. CIRTEC was eager to work with

[Industry Partners continued on page 4](#)

Manufacturing Competency Profile: A Tool for Instructional Design

By Nicholas Massa, Ph.D.

Graduates of advanced manufacturing engineering technology and related programs must possess the knowledge, skills and attitudes deemed essential by industry to be successful in the 21st century workforce. Thus, advanced manufacturing engineering technology curricula must be industry-driven and flexible, reflecting the ever changing demands of the global manufacturing sector, and must also satisfy the accreditation and certification requirements of advanced manufacturing engineering and related education and training programs.

A company's access to skilled workers is critical for growing its business. Yet nine out of 10 manufacturers are struggling to find the skilled workers they need, according to a recent SME (Society of Manufacturing Engineers) survey. To address these demands, the Advanced Manufacturing Problem Based Learning project team benefited from using a graphic representation of the SME-defined Body of Knowledge for the Certification of Manufacturing Engineers and Manufacturing Technologists called the Four Pillars of Manufacturing Knowledge.

The Four Pillars model [Figure 1] reflects knowledge areas under the four areas of major proficiencies included in the ABET (Accreditation Board for Engineering and Technology) criteria for manufacturing programs that has been developed with industry input on skills and knowledge required by manufacturing professionals. This model provided the team a tool for insights on knowledge, skills and personal attributes of an effective manufacturing engineering or technologist.

To ensure that the AM PBL Challenges adhere to the competency requirements outlined in the Four Pillars as well as the ABET Program Criteria for Manufacturing Engineering and Manufacturing Engineering Technology, three manufacturing engineering and technology education experts were recruited to align the AM PBL curriculum to the Four Pillars. To accomplish this goal, the format of the Four Pillars was modified to produce a Competency Profile for each of the six AM PBL Challenges. AM PBL consultants Ralph Disa, Gary Masciadrelli and Megan Piccus, mechanical engineering technology faculty members at Springfield Technical Community College (STCC) in Massachusetts with a combined 100+ years of industry and academic experience in manufacturing engineering, were highly qualified to develop the Competency Profile.

The AM PBL Competency Profile expands SME's Four Pillars into a matrix displaying seven main advanced manufacturing competencies across the top—materials, manufacturing processes, product design, process design (including equipment and tooling), precision measurement, and Lean/Six-Sigma (continuous improvement, and engineering economics)—and the seven stages of the product life cycle—concept design, preliminary design, detailed design, process selection, production, service, and sustainability (end of life)—along the left hand side. Each AM PBL Challenge has been aligned to the Competency

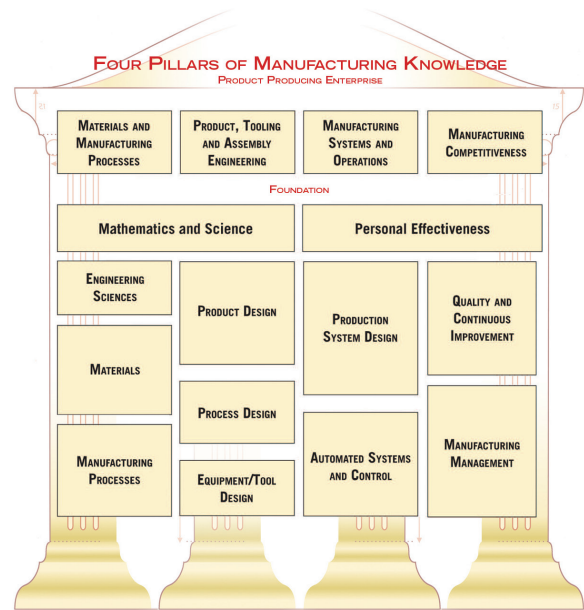


Figure 1 – SME Four Pillars of Manufacturing Knowledge (Source: www.sme.org/fourpillars)

Profile and will be available at www.pblprojects.org under the AM PBL Challenges' Standards Alignment section.

In the AM PBL Challenge Competency Profile, there are two levels of detail provided for each Challenge: a Competency Overview that clearly identifies at-a-glance which competencies are covered by each Challenge, and a detailed Competency Matrix, which expands each competency into specific and demonstrable learning outcomes that can be used to develop curricula and assess student performance. This combined level of detail enables educators to swiftly identify the Challenge(s) that best address the learning outcomes desired for their course(s).

In developing the AM PBL Challenges, the project team used the Competency Profile as a guide to select specific problems across a broad cross section of advanced manufacturing industry sectors (i.e., semiconductors, medical devices, printed circuit boards, sheet metal fabrication, nanotechnology, etc.) with the goal of addressing as many of the core competencies as possible. At the time of this writing, five of the six AM PBL Challenges have been developed and aligned with the Competency Profile. Gaps found in the Competency Profile were subsequently used to identify the sixth Challenge topic, which will deal with aerospace design with a focus on sustainable manufacturing.

Please contact Principal Investigator Fenna Hanes about becoming an industry partner at fhanes@nebhe.org or 617-357-9620 ext. 129. ■

Nicholas Massa, Ph.D. is a Professor of Laser and Fiber Optic Technology at Springfield Technical Community College and a Co-Principal Investigator of the AM PBL project. He can be reached at massa@stcc.edu.

one middle school, 14 high schools, 10 community colleges, and eight four-year colleges and universities. The middle school instructor is being funded by a pilot grant from the 21st Century Fund, a Connecticut foundation. Thirteen participants represent urban communities; 12 represent suburban, and six are rural. The majority of secondary and postsecondary STEM participants plan to implement AM PBL Challenges in courses that include chemistry, computer aided design (CAD), computer numerical control (CNC), engineering, manufacturing, physics and robotics. The majority of participating STEM educators in this group have between 6 and 10 years of teaching experience.

The majority of participating teacher education faculty members have 16+ years of teaching experience. The primary discipline in which the teacher educators will implement AM PBL is “teaching STEM education.” AM PBL will be implemented in other disciplines such as industrial technology, physics and earth science.

Participation in the AM PBL Project includes:

- Participation in two spring webinars to familiarize educators with and prepare them for the summer Institute.
- Five-day introduction to PBL professional development Institute the week of July 27, 2014 at Boston University, Boston, MA.
- Field-testing two or more AM PBL Challenges between fall 2014 and spring 2015.
- Developing a PBL Challenge using the project’s *Design Your Own Challenge* template.
- Participation in a Capstone Showcase workshop during academic year 2014 – 2015.

To foster collaboration between secondary and postsecondary institutions, the AM PBL project recruited participants in pairs called Alliances, composed of secondary and postsecondary partners. Of the 26 secondary and postsecondary participants, 20 have established an Alliance partnership. Though not a requirement of the project, the Alliance model was strongly encouraged in order to support professional development, build an academic

pipeline from high school to college, and cultivate students’ aspirations to participate in STEM and higher education.

The project team has found that Alliance partnerships are most effective and impactful when initiated by the applicants themselves and when the partnering institutions or instructors have a pre-existing relationship. Examples of Alliance partnerships include the sharing of resources such as equipment and space and the fostering of student mentor/mentee relationships between secondary and postsecondary students. The Benjamin Franklin Institute of Technology (BFIT) in Boston, for example, plans to lend its laboratory space to Jeremiah E. Burke High School students. BFIT students will serve as mentors to Burke school students as they solve industry level Challenges.

Other Alliance partnerships will involve the development and field-testing of Challenges created by AM PBL participants across levels of education. One such partnership has been proposed by the University of Hartford and Asnuntuck Community College (ACC); ACC also works with students in grades 6 – 10 in Connecticut’s East Granby school district. These Alliance partners plan to develop Challenges in advanced manufacturing disciplines such as additive manufacturing, CAD and metrology.

When asked why he was interested in the project, Assistant Professor Suhash Ghosh of the University of Hartford, Conn., explained, “I believe it is high time that instructors act as mentors to instill in their students the qualities of self-learning, thinking critically, the ability to analyze and solve complex, real world problems, finding, evaluating and using appropriate learning resources independently, working cooperatively in teams and using content knowledge and intellectual skills to become continual learners.”

To inquire about professional development please contact Principal Investigator Fenna Hanes at fhanes@nebhe.org or 617-357-9620 ext. 129. A complete list of AM PBL education partners is below. ■

AM PBL Participating Educational Institutions

Connecticut

Academy of Engineering & Green Tech.
Asnuntuck Community College
Montville High School
Sharon Center School
Three Rivers Community College
University of Bridgeport
University of Hartford

Maine

Baxter Academy

Massachusetts

Barnstable High School
Benjamin Franklin Institute of Technology

Massachusetts (cont.)

Berkshire Community College
Cape Cod Community College
Fitchburg State University
Jeremiah E. Burke High School
Massachusetts Bay Community College
Mashpee High School
Newton North High School
Stonehill College
Taconic High School
TechBoston Academy

New Hampshire

Claremont High School
Keene State College

New Hampshire (cont.)

Manchester Community College
Manchester School of Technology
Pinkerton Academy
University of New Hampshire

Rhode Island

Westerly High School
Rhode Island College

Vermont

Norwich University
University of Vermont
Vermont Tech. College / Windham
Regional Career Center
Williamstown Middle High School



Hypertherm's Manual Systems Quality Leader Chris Ballou (L) and Printed Circuit Board Assembler Caitlin Rowell (M) demonstrated the wave soldering and assembly machines featured in the Hypertherm Challenge in Lebanon, N.H. Employees at CIRTEC in East Longmeadow, Mass. at work in a manufacturing cell similar to that featured in the CIRTEC Challenge (R).

the AM PBL project team to develop an authentic medical devices Challenge due to their appreciation of having been able to hire graduates who have already been prepared to solve problems, think critically and work in teams.

"We have technicians here who have been through the PBL process and spoke very highly of what it brought to them—the problem solving skills they learned, the confidence it gave them. I think if we can contribute to that process that's very valuable," said CIRTEC's Senior Director of Special Programs Heather Dunn.

The CIRTEC Challenge problem involves building a power pack for another manufacturer's life-sustaining medical device. At the time of the transfer to CIRTEC, the device's production volume was approximately 300 per year. The customer hired CIRTEC to ramp up the production volume to 5000 devices per year and then to 15000 devices per year. The challenge was to lay out, equip and staff a manufacturing cell to meet this increased demand.

The second Challenge visit was to the world headquarters of Hypertherm, located in Hanover, N.H. The company has a presence in 93 countries. Hypertherm designs and manufactures advanced metal cutting products for use in a variety of industries such as shipbuilding, oil and gas, heavy equipment, structural steel and manufacturing. Hypertherm's product line, which is almost entirely built in the USA, includes handheld and mechanized plasma cutters and consumables, CNC motion and height controls, CAD/CAM software, as well as waterjet and laser cutting products.

Innovation has been a hallmark since 1968 when the company developed a radical injection technique that created a narrower plasma arc, capable of cutting metal with a speed and accuracy never before seen. To stay on the cutting edge of the industry, Hypertherm follows Lean and Six-sigma methodologies. All Associates continuously drive improvements across the organization and a team of Black and Green belts trained in lean and six-sigma look for ways to optimize the manufacturing and business processes and make the company's products better. The company was interested in working with the PBL Projects since it is already committed to educating a world-class manufac-

turing workforce through its Technical Training Institute, a training facility designed to address the need for skilled CNC machinists.

The Hypertherm Challenge involves an automated liquid soldering process that is used to join electronic components to printed circuit boards (PCB). When production analyses showed excessive soldering defects being generated at the soldering machines, Hypertherm was challenged with reducing PCB defects, ensuring that the liquid solder wetted effectively to the surface of the board and developing an advanced quality system.

"Participating in AM PBL is beneficial because it allows for Hypertherm to share our experiences and successes with individuals who wish to get into this line of work, or really any line of work that involves advanced problem solving," said Chris Ballou, Hypertherm's manual systems quality leader and former senior manufacturing process engineer for printed circuit boards.

Other Challenges developed in collaboration with industry partners FastCAP Systems, IBM and Sound Manufacturing were described in the fall 2013 issue of *AM PBL News*.

The project team is seeking an industry partner with whom to develop a sixth Challenge dealing with aerospace design with a focus on sustainable manufacturing. Contact Principal Investigator Fenna Hanes at fhanes@nebhe.org or 617-357-9620 ext. 129 about becoming an industry partner. ■

ATE@20 Features PBL Consulting

The PBL Projects are consulting with Kennebec Valley Community College (KVCC) in Maine to help faculty members incorporate problem-based learning into a new Energy Services Technology program that is funded by NSF's Advanced Technological Education (ATE) program. Madeline Patton covered the PBL Projects—KVCC collaboration on NSF ATE Central's blog called ATE@20. Ms. Patton's story, posted on January 27, 2014, is called "KVCC's Energy Services Tech Program Prepares Students for 8 Industry Exams." Access this story and others at www.atecentral.net/ate20.

NEBHE Launches New PBL Projects Website and YouTube Channel

The PBL Projects team is pleased to announce the launch of a new website, www.pblprojects.org, and YouTube Channel. The web launch combines the AM PBL, STEM PBL and PHOTON PBL projects websites and their industry-based case studies called Challenges into one comprehensive website. The AM PBL, STEM PBL and PHOTON PBL projects also remain accessible via NEBHE's Professional and Curriculum Development page. All of the PBL Projects Challenges can be found under the Challenges navigation button on the new PBL Projects website.

The new website, which supports Firefox, Safari, Opera, Chrome, and Internet Explorer 8, 9, and 10+, has replaced the following URL's, all of which have been redirected to the new website:

- www.ampbl.org
- www.stempbl.org
- www.photonprojects.org
- Version 1.0 of www.pblprojects.org, home to the PBL Challenges.

The PBL Projects have also launched a YouTube channel called NEBHE PBL Projects. The channel hosts videos from AM PBL Challenge visits, introductions to PBL, implementation videos, the PHOTON2 Lab Kit videos, and more. A description of recently uploaded videos is as follows:

Adapting PBL for Middle School

(Parts 1 and 2) Features five Connecticut middle school science teachers who reviewed and developed additional instructional materials for existing PBL Challenges as part of a Problem Based Learning Middle School Redesign Project in July 2013. Suggestions for middle school implementation are presented.


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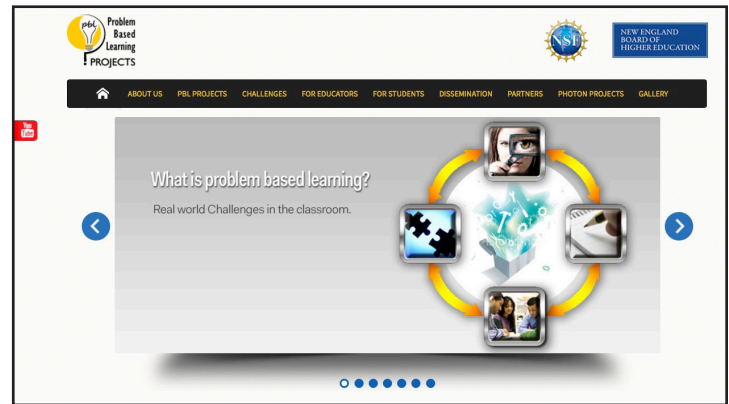
A tuition discount at out-of-state public colleges and universities in New England for hundreds of degree programs — including STEM majors in advanced manufacturing technologies.

Examples:

- Associate Degrees**
 - Composite Technology
 - Integrated Manufacturing Technology
 - Precision Metals Manufacturing
 - Spatial Information Technology
- Bachelor's Degrees**
 - Management & Engineering for Manufacturing
 - Manufacturing Engineering Technology
- Graduate Degrees**
 - Manufacturing Engineering



www.nebhe.org/tuitionbreak 617-357-9620 ext. 111 or 103 tuitionbreak@nebhe.org



Visit the new PBL Projects homepage at www.pblprojects.org.

CIRTEC Medical Devices Challenge Visit

Senior Director of Special Programs Heather Dunn discusses the unique challenges of contract manufacturing, the skills CIRTEC looks for in its employees, and why CIRTEC chose to become an AM PBL Challenge partner.

Engaging Students with Problem Based Learning

(Parts 1 and 2) Features Co-PI Nick Massa implementing a PBL Challenge from start to finish with a group of high school math students who have never used PBL before.

FastCAP Systems Challenge Visit

The videos recorded during the FastCAP Challenge feature (1) the interdisciplinary team that solved the FastCAP Challenge problem, including each team member's background, contributions to the team, and what they like about working in STEM, and (2) Director of Operations Jamie Beard discussing FastCAP's advanced technologies, the skills she looks for when hiring, and why she wanted to work with the AM PBL project.

Hyperthem Challenge Visit

Director of Corporate Improvement Charlie Hackett and Corporate Improvement Training Facilitator Alex Jaccaci discuss problem solving at Hyperthem and why they chose to partner with AM PBL.

Sound Manufacturing Challenge Visit

In the videos recorded during the Sound Manufacturing Challenge, President & CEO Kelli-Marie Valieres discusses the synergy between manufacturing and education, and how the advanced manufacturing industry has changed over time, and Vice President Ken Oliver discusses changing technology and the importance of designing with manufacturing processes in mind.

A video from the IBM Challenge recording, featured in the fall issue of *AM PBL News*, is currently available. Additionally, the PBL Projects are featured on www.manufacturingstories.com, a website dedicated to promoting manufacturing, career technical education and science, technology, engineering and math.

Please contact Project Coordinator Nicole Schepker at nschepker@nebhe.org or 617-357-9620 ext. 113 with questions or comments. ■

AM PBL Second Annual Advisory Committee Meeting

The AM PBL project held its second annual Advisory Committee meeting in Boston, Mass. on January 17, 2014. Committee members representing government and educational institutions, non-profit organizations and the manufacturing industry assist with many aspects of the project, such as identifying industry and education partners, and providing technical feedback and potential sources of future funding. Meeting highlights included reports from three Committee members and a guest, who discussed how the PBL project is providing consulting services for his institution (see p. 4).

Dale Miller and Kelli-Marie Vallieres, Advisory Committee members and industry partners from IBM and Sound Manufacturing, respectively, shared their experiences recording AM PBL Challenges. Both Miller and Vallieres felt that to reevaluate their problem solving process was valuable to their teams. Miller shared that IBM uses an eight-step problem solving approach similar to the PBL Projects' four-step process. Vallieres added that because Sound Manufacturing does not have a prescribed problem solving process, the Challenge recording motivated engineers to think differently about problem solving, which will benefit the organization overall. Based on the Challenge recording experience, Miller and Vallieres believe that PBL will help students develop the strong critical thinking and problem solving skills that industry seeks in the next generation of skilled workers.

Advisory Committee member Lisa Hix, assistant professor of sustainable product design and innovation technology at Keene State College in N.H., collaborated with the project team to host a PBL outreach workshop at her institution. The workshop attracted 17 secondary and postsecondary educators, as well as one educational consultant. Focal points of discussion included: promoting divergent vs. convergent thinking, emphasizing the research phase of problem solving, and creating rubrics that evaluate students on the basis of process, more than outcome. As a result of the workshop, seven of the 17 educators applied to participate in the AM PBL project.

The meeting also featured a presentation from guest speaker Bradley Harding, plumbing and heating instructor at Kennebec Valley Community College (KVCC) in Maine and a Co-Principal Investigator of the NSF ATE-funded Energy Services and Technology (EST) Project. KVCC has developed a new associate degree to prepare students for technician-level positions in high efficiency plumbing, heating, ventilation and cooling systems. NEBHE is consulting with KVCC faculty on integrating PBL into the curriculum. With NEBHE's support, Harding and his colleagues are developing EST-specific Challenges in partnership with local industry. Each semester, students are presented with a new Challenge related to the core trade they are studying. The first two Challenges focused on real world plumbing problems.

Harding reported that this industry-driven approach engages students in solving complex problems and will ensure EST graduates develop the critical thinking and team-building skills

that energy services employers need. With many years of work-force experience, Harding knows why these skills are critical.

The project team updated the Committee on the past year's project activities, including: Challenge development and curriculum alignment to the Society of Manufacturing Engineers core competencies, research and evaluation, selection of participants, and the Summer Institute. Following these presentations, the Committee engaged in a brainstorming session focused on barriers to advanced manufacturing careers, the AM PBL curriculum, establishing mentor relationships between Committee members and project participants, and guidance and support for scaling up the PBL Projects.

The project team thanks Committee members for their contributions to date, and looks forward to the work ahead! ■

AM PBL Advisory Committee

<i>Chris Averill</i> New England Council	<i>JoAnn Mitchell</i> Sandvik Coromant USA & SME
<i>Don Bossi</i> FIRST	<i>Jay Paterson</i> Vermont Technical College
<i>Zenagui Brahim</i> N.H. Manufacturing Extension Partnership	<i>Michael Reopel</i> Deloitte Consulting
<i>Julia di Bonaventura</i> Boston Private Industry Council	<i>Judy Resnick</i> CBIA Education Foundation
<i>Diane Dostie</i> Central Maine Community College	<i>Larry Robinson</i> Maine Manufacturing Extension Partnership
<i>Mary English</i> Virginia Tech	<i>Eugene Roundtree</i> Madison Park Technical Vocational High School
<i>Heather Graham</i> Department of Labor, USDOL ETA Region I	<i>Robert Simoneau</i> Keene State College
<i>Lisa Hix</i> Keene State College	<i>Elizabeth Sinwell</i> Foster-Glocester Regional School District
<i>Sandra D. Inga</i> Hartford Public Schools	<i>Kelli-Marie Vallieres</i> Sound Manufacturing, Inc.
<i>Marijke Kehrhahn</i> University of Connecticut	<i>Douglas Webster</i> Vermont Department of Education
<i>Emily Lebo</i> Boston Public Schools	<i>Karen Wosczyzna-Birch</i> The Connecticut College of Technology & Regional Center for Next Generation Manufacturing
<i>Dale Miller</i> IBM Systems & Technology Group	

Career Pathways in Advanced Manufacturing

The manufacturing workforce pipeline is weak due in part to lack of awareness of opportunities and misperceptions about the field. To this end, The Connecticut College of Technology (COT) and its National Science Foundation-funded Regional Center for Next Generation Manufacturing (RCNGM) collaborated with the Connecticut Business and Industry Association (CBIA) to create two Career Pathways guides. Each guide consists of worksheets for educators to use with their students and an online video library.

These free materials are available at www.nextgenmfg.org.

The first guide, “Manufacture Your Future 2.0,” is aimed at introducing a diverse audience to manufacturing careers. The second guide, “You Belong: Women in Manufacturing,” is specifically geared toward attracting women to careers in manufacturing. The “Women in Manufacturing” guide provides information on job demand, average salaries and educational pathways to manufacturing careers.

“A combination of misperceptions about the industry, lack of knowledge about what careers are available, and preconceived notions that they might not be physically strong enough or proficient enough in math and science are factors that may be keeping women from pursuing manufacturing careers,” wrote Executive Director of the COT and RCNGM Karen Wosczyzna-Birch and Executive Director of the CBIA Education Foundation Judy Resnick in the “Women in Manufacturing” guide.

Several of the accompanying videos highlight women in manufacturing, including AM PBL Co-Principal Investigator Judy Donnelly, professor at Three Rivers Community College, and AM PBL consultant Megan Piccus, professor at Springfield Technical Community College.

Both Karen Wosczyzna-Birch and Judy Resnick, mentioned above, are AM PBL Advisory Committee members.

The RCNGM is a sponsor of the AM PBL Summer Institute.

Please visit www.nextgenmfg.org to access the manufacturing career guides and to learn more about the Regional Center for Next Generation Manufacturing. ■

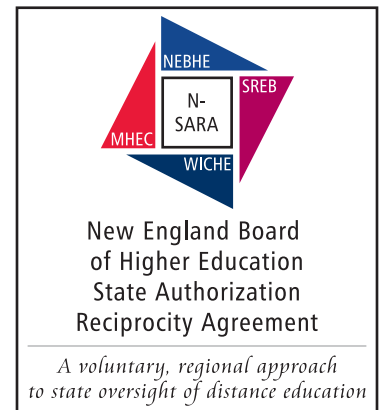
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Introducing the State Authorization Reciprocity Agreement (SARA)

The State Authorization Reciprocity Agreement (SARA) is a voluntary agreement among 50 states and four U.S. territories that establishes comparable national standards for interstate offering of postsecondary distance-education courses and programs. The underlying premise is that higher education needs a new way for states to oversee the delivery of postsecondary distance education. The current process is too varied among the states to ensure consistent consumer protection, too cumbersome and expensive for institutions that seek to provide online education across state borders, and too fragmented to support our country’s architecture for quality assurance in higher education. It is intended to make it easier for students to take online courses and programs from institutions based in another state.



An increasing number of college students—over seven million—are taking college courses online. Currently each state has the responsibility for authorizing institutions to operate in their state. Today, if an institution wants to offer its programs beyond its state borders, it must apply to each and every state to do so.

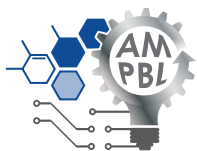
SARA was created to:

- Safeguard students and provide them with greater access to the courses and programs they want and need, as well as to protect state and institutional interests.
- Provide a national solution to the existing framework of state-by-state approvals in 54 states and U.S. territories for online education.

The four regional higher education compacts—the Midwestern Higher Education Compact (MHEC), the **New England Board of Higher Education (NEBHE)**, the Southern Regional Education Board (SREB), and the Western Interstate Commission of Higher Education (WICHE)—administer SARA. The Lumina Foundation recognized the importance of this framework and has allocated \$2.5M to fund the work.

The regional compacts began accepting applications to participate in SARA from states in their regions in early 2014. Once states are approved, they can begin to enroll eligible institutions. Membership is open to degree-granting postsecondary institutions from all sectors (public colleges, universities and independent institutions, both non-profit and for-profit) accredited by an agency recognized by the U.S. Secretary of Education.

Please contact SARA Director Sandra Doran for more information at sdoran@nebhe.org or 617-357-9620 ext. 124. ■



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Announcing the 49th Annual NAWI Conference in Portland, Oregon

CTE and STEM: Engaging Minds, Embracing Technology, Emphasizing Career, College and Innovation Readiness

The AM PBL team is pleased to announce the 49th Annual National Association for Workforce Improvement (NAWI) conference hosted at Mt. Hood Community College in Portland, Ore., from May 21 – 22, 2014. AM PBL project team members serve on the NAWI Board of Directors.

NAWI is dedicated to program improvement in Career and Technical Education (CTE) in secondary and postsecondary institutions. The NAWI conference will bring together national, state and local leaders in CTE, including administrators, teachers, career and curriculum development professionals, as well as business, industry and government partners. ■

Selected Conference Themes

- Preparing students for the workforce
- Differentiated teaching methods that work
- Identifying innovative best practices in CTE
- Creating and maintaining business/industry/education partnerships and internships
- Contributing to economic development: How CTE makes it happen

Registration closes on Thursday, May 15, 2014. Please visit <http://nawi2014.eventbrite.com> to register. You can learn more about NAWI at <http://www.nawionline.org/conference/index.html>.

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