ROGUE WORKFORCE PARTNERSHIP

Rogue Advanced Manufacturing Partnership

Date: July 15, 2016, 8:00 AM – 10:00 AM **Location: Lithia Corporate Office**

Agenda

A. **Welcome & Introductions** - Mike Donnelly

B. **Recap of RAMP Meeting in June –** Jim Fong

Development of a high-level Action Plan that addresses priority workforce issues:

- Manufacturing Awareness Campaign
- Recruiting/Maintaining a Skilled Workforce (including role of industry certifications)
- Public Policy Advocacy

C. **Recap of Educator/Workforce Partners' Meeting in June –** Audrey Theis

- State program to incent use of industry certifications
- Implications for secondary/post-secondary career technical training
- Two-day work session in the fall: embedding certifications of value to employers into programs

D. **Strategies for Recruiting/Maintaining a Skilled Workforce –** Facilitated Discussion

- Overview of key manufacturing certifications
- Prioritizing those of greatest value to regional manufacturers
- Implications for hiring and promotional practices

E. **Preliminary Discussion of Fall Planning Session with Education and Workforce Partners –** Facilitated Discussion

F. **Agreements, Assignments & Next Steps**

ROGUE WORKFORCE PARTNERSHIP

Meeting Summaries - Advanced Manufacturing Sector Strategy - June 17, 2016

Rogue Advanced Manufacturing Partnership (RAMP) Meeting

- **Attended by:** 10 manufacturing leaders (see attached list of attendees)
- **Focus of the group:** is on talent development; other critical business issues regarding infrastructure and business-to-business networking will be addressed by SOREDI and SOBIG.
- **Objectives of meeting**:
  - Provide a national and state context regarding the manufacturing skills gap
  - Review several best practices for ideas of what might work in Southern Oregon
  - Identify priority objectives in developing a regional Manufacturing Workforce Plan
- **Workforce challenges:**
  - Work readiness: students and adults lack critical workplace skills and work ethic
  - Image of manufacturing: students and influencers don't understand modern manufacturing
  - Not associated with "high tech:" not viewed as "cool" like IT
  - Cross-disciplinary skills/multi-skilled workers needed, as opposed to single discipline
  - Ambiguous loss: no longer generations of families who have done this work
  - BOLI: regulations are killing many firms
  - Drug free workplace: many applicants can't pass drug screenings
  - Educators generally totally disconnected with resurgence of high-tech manufacturing
  - Expectations for graduates of programs are too low; should expect/demand more of our public education and training providers; need better ROI for taxpayer dollars
  - **BOTTOM LINE**: Manufacturers need to set the bar higher for output and expectations from the education and workforce systems; need higher-level skilled workers in order to stay in business and compete in a global marketplace
- **Priority Area # 1: Manufacturing Awareness and Image Campaign**
  - Launch an Awareness Campaign – promote the 400+ high-tech manufacturing firms in the region
  - Explore Manufacturing Day – national campaign to open work places to students, parents, guidance counselors, teachers, etc. to showcase modern manufacturing
  - Expand outreach efforts – include women, veterans, underemployed, etc.
  - Explore teacher externships and opportunities for teachers and counselors to spend time (possibly during summer months) in industry; can earn continuing education credits
- **Priority Area #2: Recruiting and Maintaining a Skilled Workforce**
  - Workers need to be driven/motivated and want to learn
  - Need to focus on cross-disciplinary education and training
  - Need for methods to assure workers can do the job; explore use of industry certifications as means to validate skills using 3rd party assessments
  - Need further discussion on concept of competency vs. proficiency
- **Priority Areas #3: Public Policy Advocacy**
  - Need outreach to RCC, SOU and OIT Boards regarding alignment of business requirements and program offerings
  - Potential exploration of Petition IP65

Meeting Attendance

Name	Title	Organization
Neil Smith	Chief	Airscape Fans
Irene Haslet		Boise Cascade
Michael Donnelly	Material's Manager	Carestream Health
Brian Mattingly	Production Supervisor	Linde Group
Shawn Hogan	Quality Manager	Linx Technologies
Bill Thorndike	President	Medford Fabrication
Nina Johnson	HR Director	Nspired Natural Foods
Norm Kester	CEO	Quantum Innovations
Tanya Haakinson	Safety Director	Timber Products
Ron Fox	Retired Ex. Dir.	SOREDI
Jim Fong	Executive Director	Rogue Workforce Partnership
Dana Shumate	Business Services Manager	Rogue Workforce Partnership
Aurora King	Director of Business Innovation	Rogue Workforce Partnership
Tami Allison	Executive Projects Manager	Rogue Workforce Partnership
Audrey Theis		Key Links, Inc.

Education and Workforce Partners Meeting

- Attended by 16 education and workforce partners representing 9 organizations (see attached list of attendees), who want to prepare youth and adults for careers in Advanced Manufacturing.
- Focus of meeting was on industry-recognized certifications
- Tom Thompson, Oregon Department of Education, provided an overview of a new initiative supported through federal Carl Perkins funds that support Career Technical Education (CTE). The state has earmarked a pool of funds to incentive high schools to align CTE programs with industry skill needs, using 3rd party, industry-recognized certifications as the bridge. A list of certifications "approved" for state funding was circulated and reviewed.
- Meeting attendees, particularly the **school superintendents / administrators** present, **urged that regional businesses be involved in setting priorities for the schools in terms of which industry certifications were of highest value**. They urged that if business could tell them what was of value, schools would modify programs and curriculum to meet those needs and prepare students for high priority industry certifications.

- **The question was raised: will employers would be willing to take industry certifications into consideration regarding the interview and/or hiring process?** *(e.g., a guaranteed interview for holders of a regionally approved industry recognized credential)*
- In Oregon, every high school CTE program is designed to be a direct feeder into a community college program. The college is now beginning to visit the value of industry certifications in manufacturing; it already supports them in several other industry areas.
- The group then reviewed several national best practices, where the requirements of industry certifications were built into both high school CTE and community college programs of study. There was significant interest in models that incorporated "stackable credentials" spanning high school, community college and four-year institutions.
- An overview of the morning meeting with manufacturers was provided, and all attendees agreed that they were aligned with the issues raised by the employers. In fact, that were adamant that they needed business input to make smart decisions about which manufacturing industry certifications might be of most value in the region.
- **The meeting concluded with agreement that a <u>two-day planning session in the early fall</u> was in order.** It would be a voluntary meeting to which school districts and the community college could send their forward-thinking administrators and instructors in manufacturing-related disciplines to plan for alignment of selected industry certifications into identified programs of study. The RAMP would identify and prioritize the certifications of value that would drive the process, based on their deliberations during the summer months.

Meeting Attendance

Name	Title	Organization
Daniella Bivens	Director of Educational Partnerships	Rogue Community College
Bill Jiron	Director of Workforce Training & Community Education Services	Rogue Community College
Ron Fox	Retired Executive Director	SOREDI
Colleen Padilla	Executive Director	SOREDI
Kathy Trautman	Business Development Manager	SOREDI
Sherri Stratton	Area Manager	WorkSource Rogue Valley – Employment Department
Tabitha Carlson	Project Director	WorkSource Rogue Valley – ResCare
Devi-Ana Stone	Operations Supervisor	WorkSource Rogue Valley – ResCare
Cynthia Anderson	Operations Supervisor	WorkSource Rogue Valley – ResCare

Tom Thompson	Secondary/Post-Secondary Transitions - Ed. Specialist, Industrial & Engineering Systems	Oregon Department of Education
Brian Robin	Interim Coordinator – Career and Technical Education	Southern Oregon ESD
Brian Shumate	Superintendent	Medford 549C School District
Alan Barber	Director Human Resources / Secondary Education	Jackson County School District #9
Jim Fong	Executive Director	Rogue Workforce Partnership
Aurora King	Director of Business Innovation	Rogue Workforce Partnership
Dana Shumate	Business Services Manager	Rogue Workforce Partnership
Tami Allison	Executive Projects Manager	Rogue Workforce Partnership

The Manufacturing Specialist (MS) Certification is a portable and stackable industry credential that demonstrates to employers anywhere in the world that an individual has attained a certain level of industry-wide technical skills in the Math and Measurement; and Spatial Reasoning and Manufacturing Technology categories.

Achieving the MS Certification equates to successful completion of Sections One and Two of the three-part Manufacturing Technical Level 1 Assessment and measures individual skill attainment in the following nine core manufacturing skills essential to all production-related occupations in modern manufacturing:

Mathematics & Measurement Category (3 Critical Technical Skills)

Measurement

Algebra

Math for Quality

Spatial Reasoning & Manufacturing Technology Category (6 Critical Technical Skills)

Spatial Reasoning

Mechanics

Fluid Power and Thermodynamics

Electricity

Chemistry

Manufacturing Processes & Control

MSI Presents Nationally-Recognized Certification Program

Governor McAuliffe Signs New Economy Workforce Credential Grant Program Law

Dr. Victor Gray Appointed New MSI Executive Director

Community College Workforce Alliance Named VMA Partner of the Year

Virginia receives grant to help train residents with disabilities

804-643-7489 ex. 9
training@manufacturingskillsinstitute.org

Contact Us

Measurement

Demonstrate

1. Using a Decimal Inch Machinist's Rule to Measure a Length
2. Using a U.S. Ruler and Tape Measure to Measure a Length
3. Using a metric ruler
4. Measuring liquids/weights in Metric and U.S. Customary Units
5. Converting Between Common Fraction Inches and Decimal Inches.
6. Convert Between U.S. Customary Units and SI Metric Units.

Algebra for Manufacturing

1. Perform correct order of operation to simplify mathematical expressions.
2. Generate linear equations with one unknown for situations described in text.
3. Solve simple linear equations with one unknown.

Math for Quality

1. Read and interpret histograms, bar charts, line graphs, and scatter plots.
2. Interpret descriptive statistics: Mean median, mode, and range.
3. Demonstrate *qualitative* reasoning for situations involving statistical data and probabilities.

1. Visually translate from 2D drawings to 3D images and back
    1. Identifying different views for given isometric drawing of an object.
    2. Identifying the different elements of an object in various views
2. Predict behavior of visual representations of simple mechanisms

Mechanics

Demonstrate qualitative reasoning about mechanical force and systems involving pulleys, levers, and gears.

1. Determine mechanical advantage of different systems of pulleys

MSI Presents Nationally-Recognized Certification Program

Governor McAuliffe Signs New Economy Workforce Credential Grant Program Law

Dr. Victor Gray Appointed New MSI Executive Director

Community College Workforce Alliance Named VMA Partner of the Year

Virginia receives grant to help train residents with disabilities

804-643-7489 ex. 9
training@manufacturingskillsinstitute.org

Contact Us

2. Determine effects of different lever configurations on the force required to lift an object
3. Generate different configurations of gears and axels to increase power or speed.

Fluid Power and Thermodynamics.

Generate causal explanations of behavior of (a) simple systems involving changes in pressure, temperature and volume, (b) simple hydraulic/pneumatic devices and (c) principles of heat transfer.

1. Predict the effects of changes in pressure on volume and temperature
2. Predict the effects of changes in temperature on volume and pressure
3. Predict the mechanical advantage of simple hydraulic and pneumatic systems.

Electricity

1. Generate causal explanations of the relationship between electrical and magnetic forces and explanations of how electric motors, generators, solenoids, and relay switches behave.
2. Generate causal explanations and predictions of electric circuit behavior involving simple series and parallel circuits containing relays, capacitors, resistors and simple devices such as light bulbs and pumps.

Chemistry

1. Core Concepts: Classify substances as a molecule, element, mixture, or compound; classify changes in substances as chemical reaction, mixture, or physical change; classify and apply characteristics acids and bases; interpret the periodic chart; and classify methods for separating mixtures (filtration, evaporation, distillation).
2. Chemical Reactions: Explain chemical bonding and structural changes that take place in common chemical reactions and interpret chemical formulas and equations.
3. Polymers: Generate explanations of molecular structural difference and physical characteristics between common types of polymers such as slime, flexi- putty, rubber and plastic bags.

Manufacturing Processes & Control

1. Generates the *Sequence of Operation* and a *Flow Diagram* for production tasks and processes.
2. Generate explanations of how electrical-mechanical controls and sensors operate in simple systems and devices.
3. Create flow charts for models (mock-up) of simple computer controlled systems such as a traffic light or washing machine.

Quality and Lean Manufacturing Concepts

1. Identify descriptions of manufacturing quality and lean production initiatives as examples of value stream mapping, waste elimination, 5S, DMAIC, and Total Productive Maintenance (TPM)
2. Create a process map and value stream map to improve a process or reduce waste
3. Demonstrate using a industry standard problem solving method such as DMAIC for improving production processes. Currently using DMAIC.

SPC Basic concepts

1. Determine plausible causes in fluctuations in processes based on statistical information (mean, range, & variation patterns)

Business Acumen

1. Predict how actions, strategies, and decisions impact the bottom line.
2. Classify examples of common business financial terms.

National Institute for Metalworking Skills®

SECTION 2

NIMS Credentials

The NIMS Credentials certify an individual's skills as measured against the NIMS Standards. Earning NIMS credentials requires a performance test and a theory test. The performance requirements and theory tests are drawn directly from the NIMS Standards, and are written and piloted by industry. NIMS currently offers 52 metalworking credentials.

Machining Level I *Designed to meet entry-level requirements for on-the-job skills*	Measurement, Materials & Safety Job Planning, Benchwork & Layout Manual Milling Skills I Turning Operations: Turning Between Centers Turning Operations: Turning Chucking Skills Grinding Skills I Drill Press Skills I CNC Turning: Programming Setup & Operations CNC Milling: Programming Setup & Operations CNC Turning: Operations CNC Milling: Operations
Machining Level II *Designed to meet journey-level requirements for on-the-job skills*	Manual Milling Skills II Turning II (manual) Drill Press Skills II Grinding Skills II CNC Milling Skills II CNC Turning Skills II EDM — Wire EDM — Plunge
Machining Level III *Designed to meet master-level requirements for on-the-job skills*	CNC Turning Skills III CNC Milling Skills III
Metalforming Level I	Metalforming Level I
Stamping Level II	Operate with Single Hit Tooling II Operate with Compound Dies II Operate with Progressive Dies II Operate with Deep Draw Dies II Operate with Transfer Dies II
Stamping Level III	Parts Inspection & Quality Control Setup with Single Hit Tooling III Setup with Compound Dies III Setup with Progressive Dies III Setup with Deep Draw Dies III Setup with Transfer Dies III

Figure 1. Framework for Level I Metalforming Skills

This figure represents the two principal sets of expectations that comprise Level I Metalforming Skills. The left-hand column is a listing of the duties that expected to constitute Level I jobs. The right-hand column is a listing of the abilities, skills, knowledge, or other characteristics that are needed to perform the duties.

Occupational Duties	Knowledge, Skills, Abilities, and Other Characteristics
1. Job Planning and Management 1.1 Read Job Process Plan 1.2 Identify and Respond to Warning Signals During Production Operations	**1. Written and Oral Communication** 1.1 Reading 1.2 Writing 1.3 Speaking 1.4 Listening
2. Quality Control and Inspection 2.1 Part Inspection 2.2 Process Control	**2. Mathematics** 2.1 Arithmetic 2.2 Applications in Statistics
3. Process Adjustment and Improvement 3.1 Participation in Process Improvement	**3. Decision Making and Problem Solving** 3.1 Applying Decision Rules 3.2 Basic Problem Solving
4. **General Maintenance** 4.1 General Housekeeping and Maintenance 4.2 Preventive Maintenance, Machine Tools 4.3 Adjust Lubrication System, Fill and Refill the Lubrication Systems	**4. Interpersonal Skills and Personal Qualities** 4.1 Interpersonal Skills 4.2 Personal Qualities
5. **Industrial Safety and Environmental Protection** 5.1 Material Movement Handling 5.2 Hazardous Materials Handling and Storage 5.3 Identify and Demo Usage of Machine Safety Equipment 5.4 Lock-Out, Tag-Out Procedures	**5. Engineering Drawings** 5.1 Standard Part Drawings
6. **Career Management and Employment Relations** 6.1 Career Planning 6.2 Job Applications and Interviewing 6.3 Teamwork and Interpersonal Relations 6.4 Organizational Structures and Work Relations 6.5 Employment Relations	**6. Measurement** 6.1 Basic Measuring Instruments 6.2 Precision Measuring Instruments
	7. Safety 7.1 OSHA Regulations
	8. Metalforming Theory 8.1 Understanding Metalforming Equipment 8.2 Material Properties 8.3 Lubricants, Cutting Fluids, and Application 8.4 Identify Types of Tooling 8.5 Material Delivery Systems

The National Institute for Metalworking Skills, Inc., recognizes that career paths can develop from four major occupational groups in the metalworking industry (see Figure 1). These are machining, tooling, metalforming, and industrial maintenance occupations. Within each occupational group or cluster, multiple job titles can exist and such titles as may be invoked is the prerogative of individual metalworking companies. The Institute focuses on defining skills and recommends that each occupational cluster reflect increasing levels of competency or skills. Three skill levels are suggested for each major cluster.

2. Description of Typical Level I Machining Responsibilities

An individual with Level I Machining Skills is a *skilled* machine operator or technician who has demonstrated competence in three major areas of responsibility:

1. basic bench operations
2. basic metal cutting operations
3. basic inspection and quality assurance functions.

This individual can perform these responsibilities in both single and multiple part production. No direct supervision or training responsibilities of other operators or other production workers is assumed at level I.

Level I Machining Responsibilities typically include the ability to: **(Note: These are not the standards)**

Bench Operations:

- Select and use hand tools.
- Perform basic, routine layout.
- Read and comprehend information on orthographic prints and job process sheets for routine manufacturing operations.
- Deburr.
- Perform hand fitting and minor assembly.
- Perform bench cutting tasks such as sawing, reaming, and tapping.
- Perform basic, routine preventive maintenance.
- Perform basic housekeeping responsibilities.

Metal cutting operations:

- Identify basic metallic and non-metallic materials.
- Identify and use most accessories and tooling for machining operations.
- Choose an appropriate speed and feed for a given operation.
- Perform basic process planning, setup, and operation of common classes of machine tools such as turning, milling, drilling, or surface grinding machines.
- Select and use coolants appropriately.
- Make suggestions for improving basic machining operations within a structured improvement process.
- Be competent in all safety procedures for all machining operations and material handling and disposal within their responsibility.

Inspection and quality assurance responsibilities:

- Use basic precision measurement tools.
- Follow an inspection process plan.
- Perform basic quality assurance responsibilities for both single and multiple part production including statistical process control.

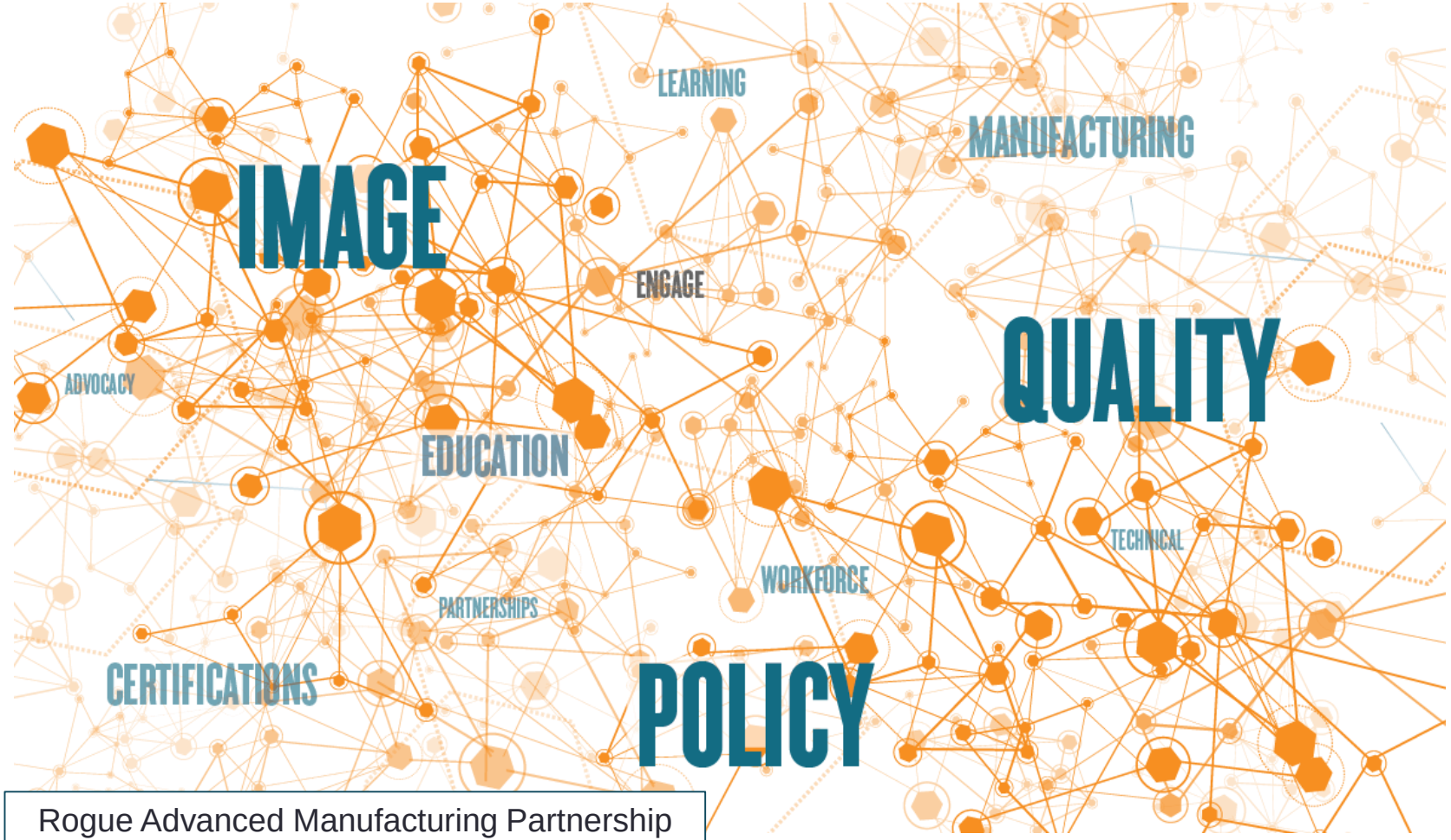
Other competency areas:

- Follow standardized work procedures in a limited range of standardized work contexts under direct supervision.
- Be competent in all basic aspects of seeking and maintaining employment in the metalworking industry.

3. Education and Training

Most trainees can acquire the core Level I Machining Skills in six months to one year of education and training, depending on prior manufacturing experience, basic academic skills, mechanical aptitudes, and the availability of laboratory-based training. This training could be given in a high school or community college vocational/technical education program, apprenticeship program, formal company training program, or structured on-the-job training. Existing workers may be able to demonstrate their competence against the standards in shorter time periods and access necessary education and training through community colleges, private programs training centers, retraining or upgrading.

Building a Manufacturing Talent Pipeline



Rogue Advanced Manufacturing Partnership
July 15, 2016

Presentation Objectives

- Recap of Educator/Workforce Partners' Meeting in June
- State Department of Education program to incent use of industry certifications in high school Career Technical Education (CTE) Programs
- Implications for secondary/post-secondary career technical training

Our task today:

- Overview of key manufacturing certifications
- Prioritize those of greatest value to you AND other regional manufacturers
- Implications for hiring and promotional practices

Traditional vs. Emerging Approaches to Public-Private Partnerships

Traditional Approach	Needed for Scale
Program/funding driven Project-based Time-limited	Problem-oriented Systemic change Responsive to industry, worker, and jobseeker needs over the long term
Work with employers individually	Work with employers as a group Aggregate needs
Transactional Address needs of an individual, particular hire	*Relational* Sustained involvement over the long term
Work within a government jurisdiction or service delivery area	Work within an industry or sector's labor market
Produce programmatic outcomes	Change the way systems work

A Significant Problem: Building a Talent Pipeline for Manufacturing Companies

Open positions cost $$$!

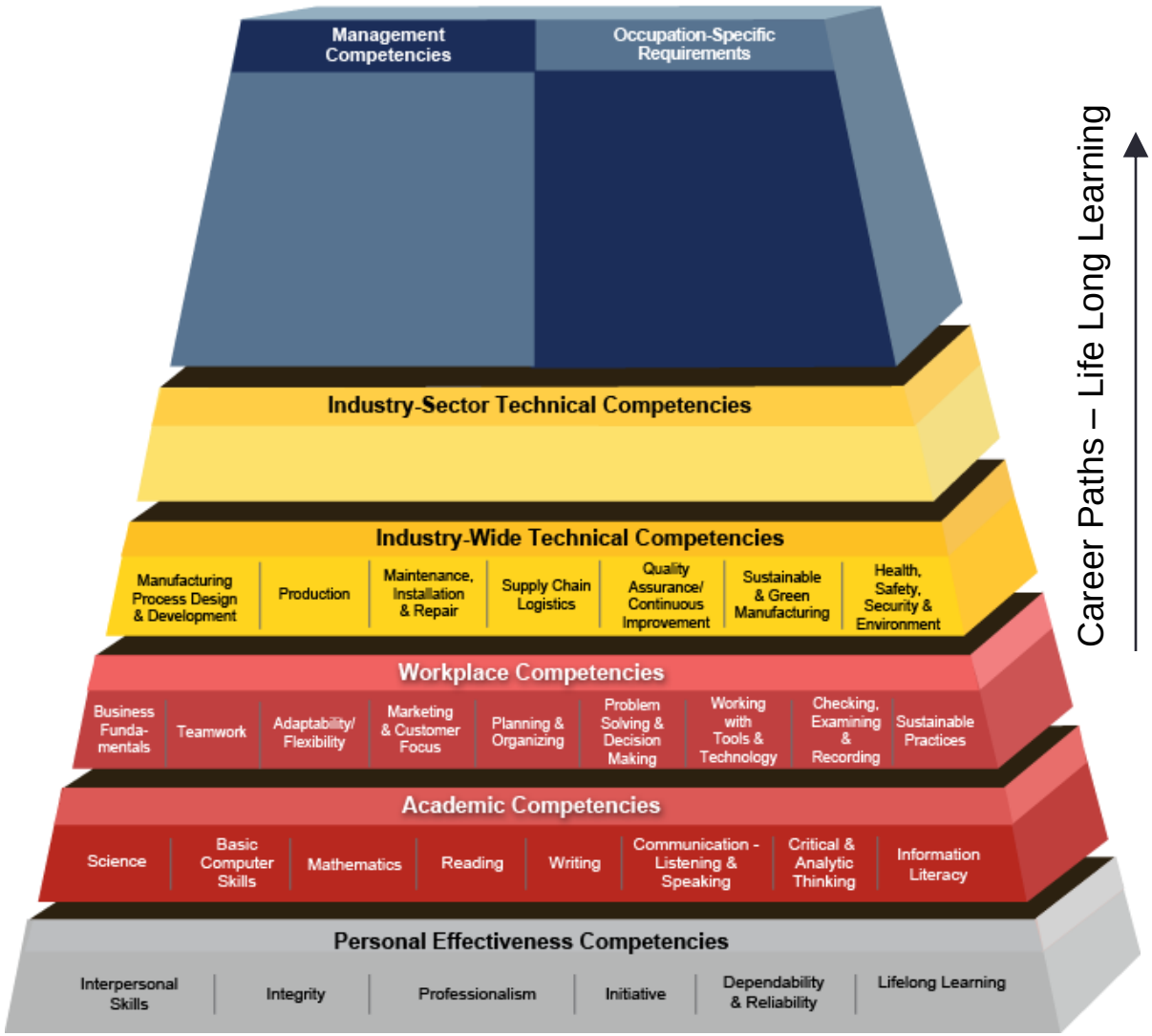
The lack of skilled employees to fill available jobs is creating significant costs for companies:

- 55% of companies report a >5% increase in **production down time**
- 60% of companies report a >5% increase in **production cycle time**
- 70% of companies report a >5% increase in **overtime**

Manufacturing Institute & Accenture, 2014

One Solution: Use Industry Certifications to validate worker skills

Advanced Manufacturing Competency Model



Career Paths – Life Long Learning

High Quality Middle Class Jobs

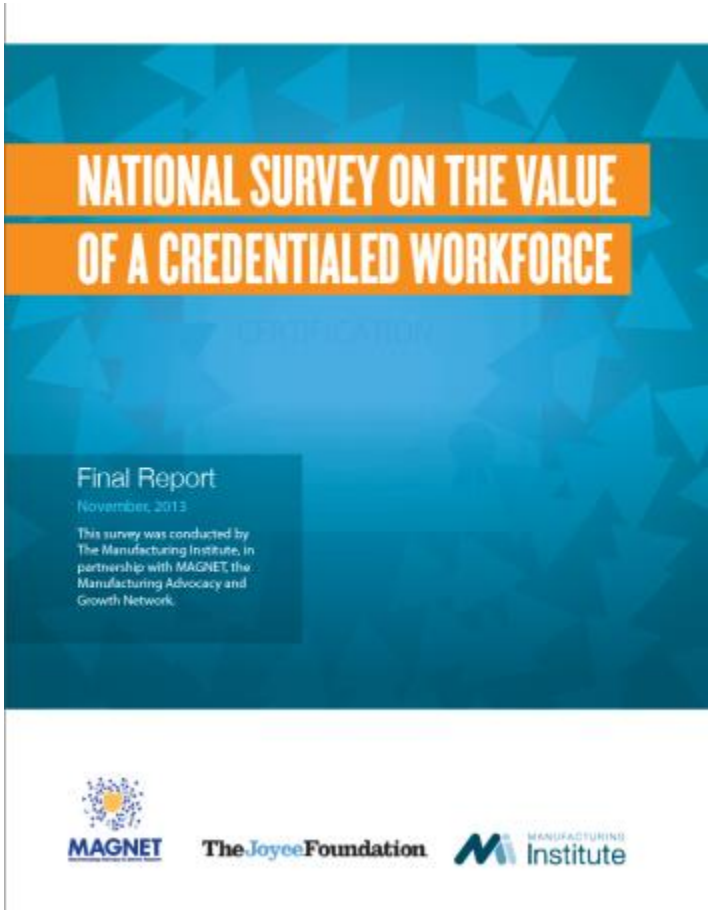
Occupation-Specific Certifications (AWS/NIMS))

Entry Level Industry Certifications (MSSC/CPT)

Ready for Work, Ready for College (NCRC)

Value of Industry Certifications

- Over 90% of companies that use industry-recognized certifications believe they make a difference in validating the skills of their employees;
- Community colleges are the most used partner by companies looking to incorporate certifications, but more high schools are getting involved.



Benefits

- Improved hiring practices
- Minimizes “guesswork” in selection and promotion
- Saves money and improves bottom line
- Ensures training includes knowledge and skills required for the job
- Develops a certified, professional technical workforce

Employer-Identified Results

- More job-ready candidates
- Shorter training/OJT time
- Improved safety and quality
- Reduced turnover
- Better promotion decisions
- Enhanced equipment effectiveness
- Increased productivity
- Improved company performance

Understanding the Market

450 Certificates and Certifications

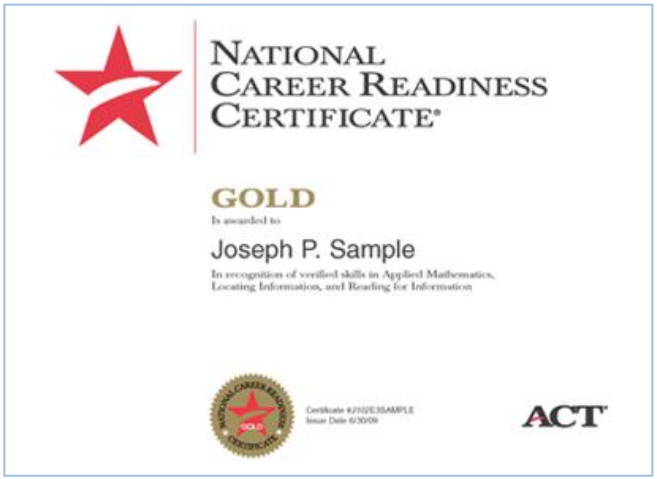
- Aligned to the Manufacturing Competency Model
- Nationally Portable
- Third-Party Validated (ISO/ANSI Preferred)
- Industry-Driven
- Data Based and Supported

Which are of greatest value to manufacturers????

National Association has selected 12 and created a Skills Certification System

SKILLS CERTIFICATION SYSTEM

National Career Readiness Certificate



ACT: What is the NCRC?

The National Career Readiness Certificate, issued by ACT, is a portable, evidence-based credential that measures essential workplace skills and is a reliable predictor of workplace success. This credential is used across all industry sectors and measures these skills:

- Problem solving
- Critical thinking
- Reading and using work-related text
- Applying information from workplace documents
- Applying reasoning to workplace problems
- Setting up and performing work-related mathematical calculations
- Locating, synthesizing and applying information that is presented graphically
- Comparing, summarizing, and analyzing information presented in multiple related graphics

How It Works
ACT: National Career Readiness Certificate (NCRC)

- Qualifying for the NCRC
  - Score at least a Level 3 on each Work Keys assessment–Applied Mathematics, Locating Information, Reading for Information
  - 33-35 items, 1 hour each
  - Proctored administration in secure environments
  - Available at authorized test centers – high schools, community and technical colleges, workforce agencies, ACT distribution partners
  - Offered in computerized and paper formats

Oregon Employer Guide to the NCRC:

https://www.oregon.gov/ccwd/pdf/NCRCEmployerGuide.pdf

Manufacturing Skill Standards Council (MSSC): Certified Production Technician

MSSC: What is the Certified Production Technician (CPT)

Modules:

- Safety;
- Quality Practices & Measurement;
- Manufacturing Processes & Production; and
- Maintenance Awareness.

CPT Key Work Activities

Safety

- Work in a safe and productive manufacturing workplace
- Perform safety and environmental inspections
- Perform emergency drills and participate in emergency teams
- Identify unsafe conditions and take corrective action
- Provide safety orientation for all employees
- Train personnel to use equipment safely
- Suggest process and procedures that support safety of work environment
- Fulfill safety and health requirements for maintenance, installation and repair
- Monitor safe equipment and operator performance
- Utilize effective, safety-enhancing workplace practices

Quality Practices & Measurement

- Participate in periodic internal quality audit activities
- Check calibration of gages and other data collection equipment
- Suggest continuous improvements
- Inspect materials and product/process at all stages to ensure they meet specifications
- Document the results of quality problems
- Communicate quality problems
- Take corrective actions to restore or maintain quality
- Record process outcomes and trends
- Identify fundamentals of blueprint reading
- Use common measurement systems and precision measurement tools

CPT Key Work Activities cont'd

Process & Production

- Identify customer needs
- Determine resources available for the production process
- Set up equipment for the production process
- Set team production goals
- Make job assignments
- Coordinate work flow with team members and other work groups
- Communicate production and material requirements and product specifications
- Preform and monitor the process to make the product
- Document product and process compliance with customer requirements
- Prepare final product for shipping or distribution

Maintenance Awareness

- Prepare preventative maintenance and routine repair
- Monitor indicators to ensure correct operations
- Perform all housekeeping to maintain production schedule
- Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems with:
  - electrical systems;
  - pneumatic systems
  - hydraulic systems;
  - machine automation systems
  - lubrication systems
  - bearings and couplings

Training Overview

- Fully-online OR blended online + instructor-led (MSSC curriculum)
- Includes pre- and post-tests to allow students and instructors to gauge progress

2 course formats

- Regular Courses: 35-40 hours, 3-credit equivalent, for each module
- Fast Track: fully-online, 16-18 hours for each module; designed for incumbent or dislocated workers with previous manufacturing experience

NOTE: Skills can also be embedded in regular high school or college programs without purchasing the MSSC curriculum

Benefits to Industry

- Offers a pipeline of highly-skilled *knowledge* workers
- Decreases recruitment costs by providing job candidates with industry-recognized credentials
- Eliminates remedial training costs
- Serves to attract, motivate and retain qualified employees
- Provides agile workers capable of keeping pace with technological change

Manufacturing Technician Level 1 (MT1)

Manufacturing Skills Institute

What is a Manufacturing Technician?

A MT1 operates precision machinery, systems and processes. Typical skills expected in these positions usually include:

- CAD skills, computer controlled machine programming, precision measurement, process and machine trouble-shooting, problem-solving, machine maintenance and proficient use of diagnostic and statistical tools.
- These positions generally describe someone who has enough broad-based knowledge about a multi-step process to successfully troubleshoot and solve problems beyond the scope of typical “machine operators”.
- Sample MT1 Job Titles: Operator, Production Operator, Production Technician, Technician, Chemical Equipment Operator, Chemical Operator, Fixers, CNC Technician Manufacturing Technician and Production Manufacturing Specialist.

MT1 Certifications

- The MT1 program addresses the core industry-wide skills standards required for skilled production occupations in all sectors of manufacturing.
- The complete MT1 assessment includes three certificate modules: Math and Measurement; Spatial Reasoning and Manufacturing Technology; and, Quality and Business Acumen.
  - The **Manufacturing Specialist (MS) Certification** is awarded to individuals upon a successful pass rate of 75% on the Math and Measurement, and Spatial Reasoning and Manufacturing Technology MT1 certificate modules.
  - The **Manufacturing Technician Level 1 (MT1) Certification** is awarded to individuals upon a successful pass rate of 75% on all three of the MT1 certificate modules.

Training Overview

MT training is available in three formats:

(1) Online Learning Lab™ via a web-based portal that is password protected and accessible 24/7

(2) (2) instructor-led Action Learning Lab™ onsite or alternate location selected by the employer, and

(3) (3) blended Online Learning Lab™ and Action Learning Lab™program customized to employer specifications and usually on the job (OJT)

Participants develop high performance skills through demonstrations, lectures, self-paced studies, labs, technical presentations, critical thinking, problem solving, and individual/group activities.

American Welding Society (AWS)

AWS Certifications

- Certified Welder ***
- Certified Welding Inspector
- Senior Certified Welding Inspector
- Certified Welding Educator Program
- Radiographic Interpreter
- Certified Welding Supervisor
- Sales Reps
- Engineer

Certified Welder

- The Certified Welder certification is based on a performance-based assessment. Final certification provides "transferrable" credentials that are recognized internationally.
- The Certified Welder (CW) tests to procedures used in the structural steel, petroleum pipelines, sheet metal and chemical refinery welding industries. There is a provision to test to a company-supplied or non-code welding specification.

Benefits of AWS

Companies use the credential to verify certain skills, especially within the field of welding.

AWS certifications are recognized both nationally and internationally. Companies recognize that AWS certification ensures high quality employees with excellent skills in their field.

Since certifications have to be renewed every six months, employees are always kept up to date and learn new skills. AWS certification shows that a candidate has a broad range of skills.

National Institute for Metalworking Skills (NIMS): Machining and Metalworking

NIMS Certifications: Machining and Metalforming

NIMS certifies individual skills against the national standards. The NIMS credentialing program requires that the candidate meet both performance and theory requirements. Both the performance and knowledge examinations are industry-designed and industry-piloted.

There are 52 distinct NIMS skill certifications

- Machining Levels 1-3
- Metalforming Level 1
- Stamping Levels 2-3
- Press Brake Levels 2-3
- Slide Forming Levels 2-3
- Screw Machining Levels 2-3
- Die making Levels 2-3
- Machine Building Levels 2-3
- Machine Maintenance, Service, and Repair Level 3

Broad-based Employer Input

- Stakeholder base of over 6,000 metalworking companies.
- Major trade associations have invested over $7.5 million in private funds for the development of the NIMS standards and its credentials.
- NIMS certifies individual skills against the national standards. The NIMS credentialing program requires that the candidate meet both performance and theory requirements.
- All exams are industry-designed and industry-piloted. There are 52 distinct NIMS skill certifications.
- Industry uses the credentials to recruit, hire, place and promote individual workers.

MANUFACTURING Institute

ALIGNING EDUCATION, CERTIFICATION, AND CAREER PATHWAYS

Advanced Technology Manufacturing Academies at the Alamo Colleges

EDUCATION PATHWAY	↔	CERTIFICATION PATHWAY	↔	CAREER PATHWAY
BACHELOR OF APPLIED ARTS & SCIENCE / ENGINEERING DISCIPLINE (**Potential path not currently articulated*) • Texas State,UTSA, St. Mary's University *	↔	• SME	↔	• Plant Engineer • Mechanical Engineer • Management $50k - $140k (11-3051, 17-2141)
ASSOCIATE IN APPLIED SCIENCE: Manufacturing Operations Technician CNC Manufacturing Technician • 63-69 hours/ 2 years full time • 21 courses • Day/evening curriculum	↔	• AWS Certified Welder D.1.1 • MSSC Maintenance Awareness • MSSC Manufacturing Practices • MSSC Quality Practices and Measurement • MSSC Safety • Career Readiness Certificate	↔	• CNC Technician • Manufacturing Maintenance Technician • Production workers/assemblers $21k - $54k (51-4010, 51-2092, 51-2031,)
High School Year 2 • CNC Tool Operator Certificate or Manufacturing Operations Maint. Assistant • Dual Enrollment • 6 courses/17 credit hours	↔	• MSSC Manufacturing Practices • MSSC Maintenance Awareness • Career Readiness Certificate	↔	• Entry level operators • Maintenance helpers • Team Assemblers $17k - $54k (51-2092, 51-2031)
High School Year 1 • Dual enrollment • Marketable Skills Certificate-Machining • 5 courses/14 credit hours	↔	• MSSC Quality Practices & Measurement • MSSC Safety • Career Readiness Certificate	↔	• Maintenance Helper $17k - $40k (49-9098)

National Career Readiness Certificate
Personal Effectiveness * Academic Competencies Workplace Competencies

Applied STEM (High School)	Out of School/Low Skill Youth/Adults	Skilled Adults
Dual Enrollment - Career Academy – Youth Development Programs	WIA/Career Centers – ESL/VESL - GED/ABE "Bridge" and Foundation Programs	Retraining/Lay Offs – Continuing Education Company Specific Apprenticeship

Produced with support from
Key Links

Industry Certifications: Who Pays?

Sustainability

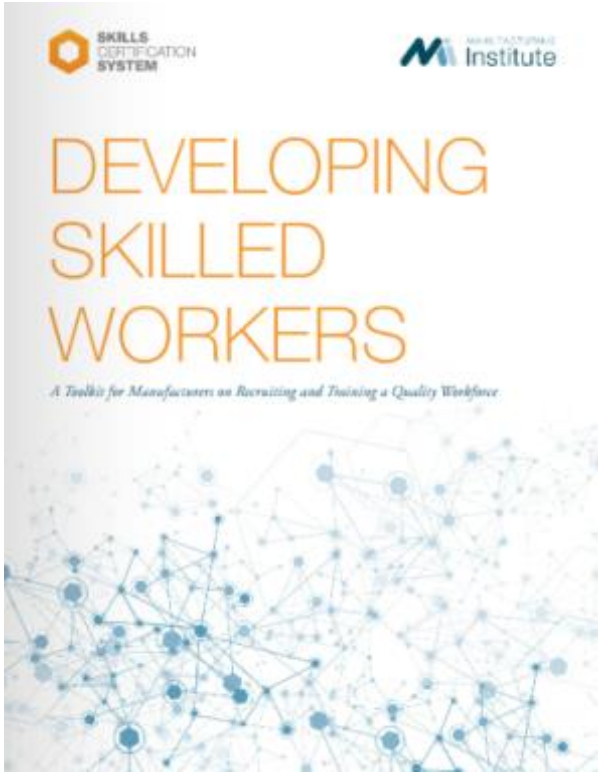
- **Individual Pays**: Models for student fees that include industry certification testing
  - Costs embedded in student fees
  - Optional vs. mandatory assessment
- **Employer Pays**: Employer absorbs costs of certification testing
  - Upfront fees for new hires
  - Tuition assistance for incumbent workers
- **Government/Taxes Pay**: Public funding offset costs
  - Use of Perkins/WIA/Pell/GI Bill to fund industry certifications as allowable activities
- **Combination Models:** Unique and creative combinations of funding sources are pooled to cover costs

What can you do?

Employers
- Prefer certifications as part of your hiring and promotional practices
- Ask education partners to deliver certified students

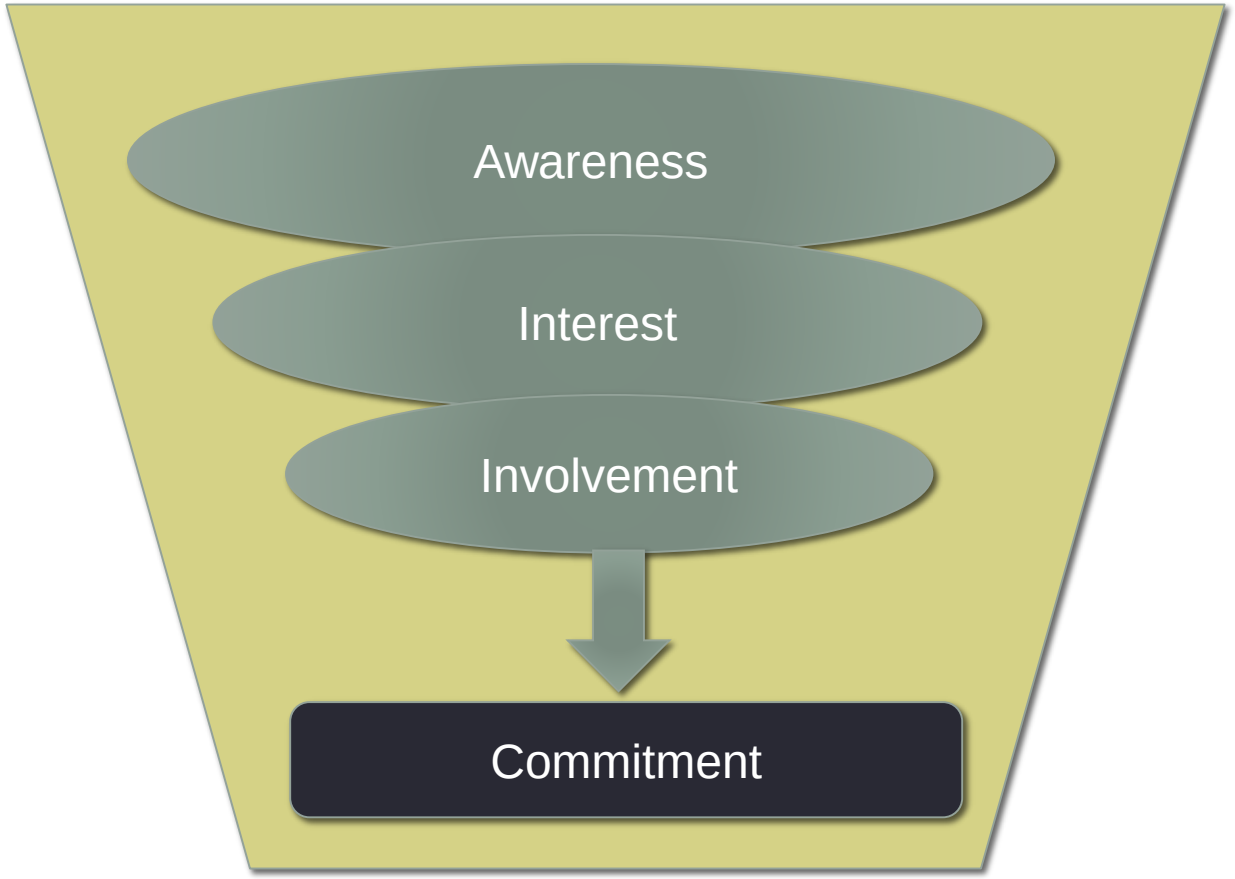
Educators
- Align manufacturing programs with certifications and certify students
- Support faculty development, including certifying instructors

Community Leaders
- Promote certification as an economic development tool
- Strengthen connections among employers, educators and the workforce system



http://www.themanufacturinginstitute.org/

Stages of Employer Engagement



Adapted from the Commonwealth Corporation, Strategic Employer Engagement, 2013.