

Building a Credentialed Manufacturing Talent Pipeline



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Center of Excellence
www.fl-ate.org

Key manufacturing challenges

- ✓ **Globalization**
 - Growing markets
 - Fierce competition
- ✓ **Innovation**
 - Needed R&D
 - The post-Aluminum era
- ✓ **Talent**
 - Filling the pipeline
 - Skills gap



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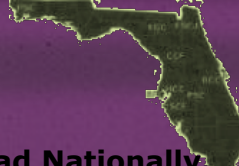
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Closing the skills gap

- ✓ The skills gap is real
- ✓ It costs 11% potential earnings due to
downtime
overtime
cycletime



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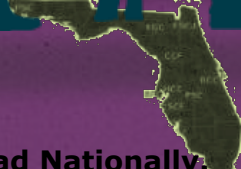
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Talented workers are lost to misperceptions

3 out of 10 parents would encourage their kids into manufacturing as a career



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Changing perceptions



www.mfgday.com

www.mfgday-fl.com



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Inside a Good Industry Credential

- Critical Work Functions
- Key Activities
- Performance Criteria
- Occupational Skills, Knowledge & Attributes
- Academic & Employability Knowledge & Skills
- Statement of Assessment



6

DOL Department of Employment and Training

Definition

Credential refers to a verification of qualification or competency issued to an individual by a third party with the relevant authority or jurisdiction to issue such credentials

Components:

- Third party (associations or companies)
- Establish professional standards
- Successful examination score
- Defensible standards
- Require training or work experience



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Example Credentials

Educational Diplomas or Certificates

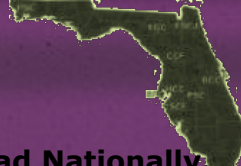
Registered Apprentice Certificates

Occupational License

Industry Specific Credentials

Business Sponsored Credentialed

Other Credentials



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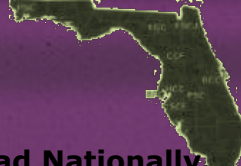
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Considerations

I. To be credible

- Subject Matter Experts (SMEs) Involved
- Process (APA, AERA, ANSI, others)
- Standards (proprietary vs non; defined scope)
- Assessment (written, performance, both, technical manual)
- Credential process (renewals, cost, accessibility)



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Considerations

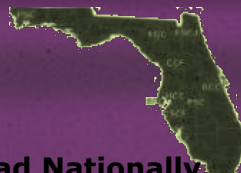
II. Value

- Signal abilities /skills of credentialed workers
- Report info
- Instructional improvement



Questions / Concerns

- Is there credible signaling power?
- Motivation of the certificate deliverer/s?
- Does the credential align with a program of study?
- Are there reports available to education?
- Who pays for individual credentials?
- Is there a skill demonstration?



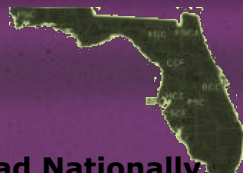
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Additional Uses

- Teacher effectiveness
- Articulations
- Public relations
- Engagement of constituents
- Regulatory requirements
- Professional development



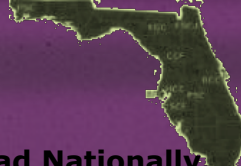
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Transparency

- We need a strong technical workforce with verified competence
- CTE programs deliver competence
- We need a transparent and objective way to communicate competence to others (employers)
- We need ways to increase student retention, engagement and motivation
- Must be credible and easy to use



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Quality Education



**SKILLS
CERTIFICATION
SYSTEM**

Defining Credentials

1. Competencies are components of a broader skill set, a skill set usually linked to a technical career. (eg. rafter layout to carpenter)
2. That broad skill set can be evaluated by comparison to credible, reliable, valid, and nationally determined standards (eg. National Association of Home Builders)
3. If the desired standard is met on an evaluation, or assessment, a credential is awarded

Video: <http://youtu.be/NIfYCzUMfuY>



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**SKILLS
CERTIFICATION
SYSTEM**



credential partners

ACT



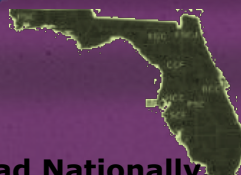
APICS



MSI
MANUFACTURING
SKILLS INSTITUTE



NADCA
NORTH AMERICAN DIE CASTING ASSOCIATION



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**SKILLS
CERTIFICATION
SYSTEM**



**In recent years, SCS reported
over 750,000
Manufacturing industry
certifications**



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MECHATRONICS Industry Credentials

NIMS



PMMI



Siemens

SIEMENS

Online SCS educational listings

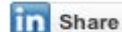
Resources

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The Manufacturing Institute is working with manufacturing certification organizations who are the world market leaders in skills certification programs. This collaborative effort resulted in an organization of the certification programs, and the credentials they offer, into a system of "stackable credentials" that can be awarded in post-secondary education.

The following areas are currently covered by the Skills Certification System:

[Foundation Skills](#)

[Cross-Cutting Technical Skills](#)

[Machining & Metalworking](#)

[Welding](#)

[Automation](#)

[Construction](#)

[Die Casting](#)

[Fabrication](#)

[Fluid Power](#)

[Lean](#)

[Mechatronics](#)

[Quality](#)

[Transportation, Distribution, & Logistics](#)

[Technology & Engineering](#)

The Institute is currently developing certification pathways for the following sectors:



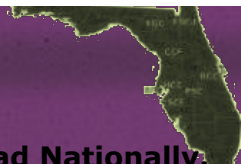
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Senior Vice President & Tr

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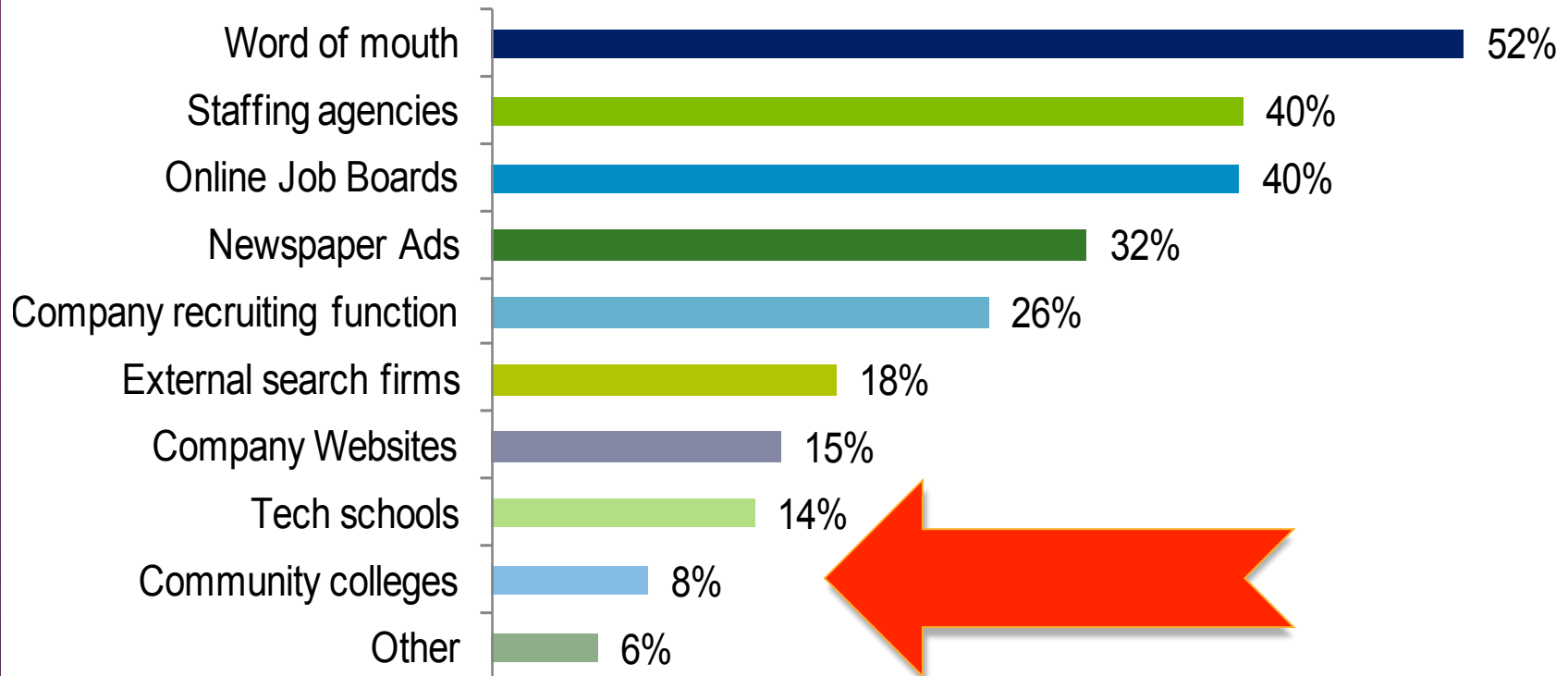


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Manufacturers need new workforce strategies

Top sources for new employees



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The Manufacturing Institute & Deloitte - October 2011

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Credentialed career pathway

Public – Private Partnership

Talent Pipeline

Employee Development

General Laborer

- \$9-12/hour
- NCRC Plus
- High School

CNC Operator

- \$11-16/hour
- NIMS Level 1
- 1-4 Certifications
- 12-18 Weeks Training

CNC Machinist

- \$14-22/hour
- 1-2 Year Training/ Education and Experience
- Additional NIMS

Skilled Technician

- \$18-28+/hour
- 2-year +; Journeyman & experience

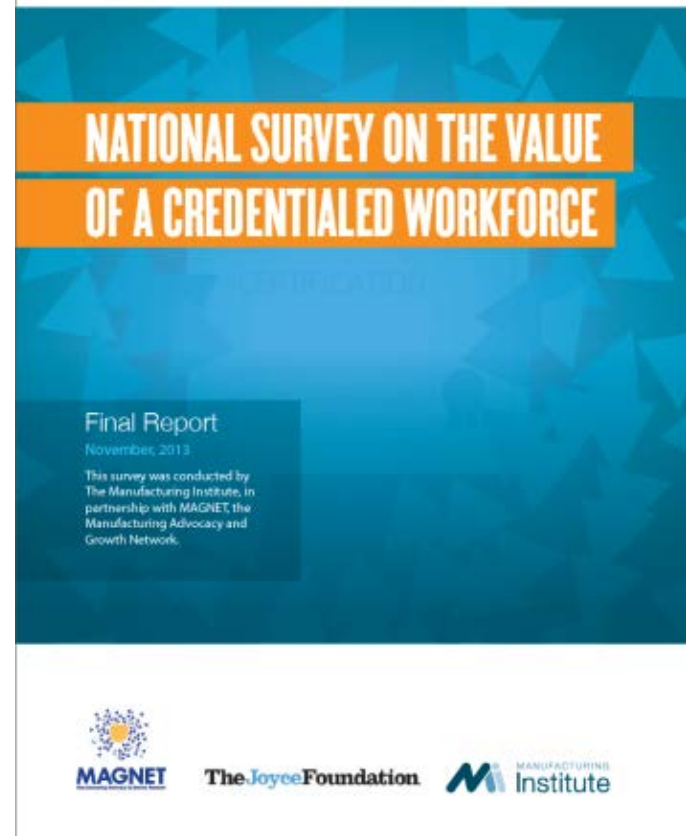
High School, Out-of-School, Low Skill Youth,
Low Skill Adults, Transitioning Veterans

Skilled Adults

Value of credentials

Over 90% of companies that use industry-recognized certifications believe they make a difference in validating the employees

Community colleges are the most used partner by companies looking to incorporate certifications.



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FLORIDA'S MANUFACTURING CREDENTIALALED PATHWAYS



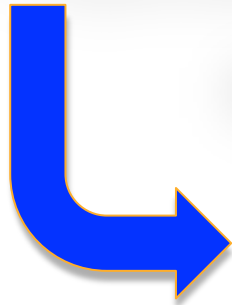
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Florida manufacturing pathways

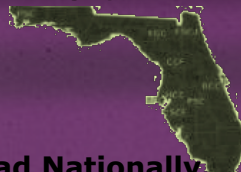
Middle school

- Fundamentals of Manufacturing
- Introduction to Manufacturing
- Exploration of Production Technology
- Exploration of Engineering Technology
- Exploration of Robotics Technology



High school

- Materials and Processes Technology
- Production Technology
- Computer Integrated Manufacturing
- Applied Robotics
- Automation & Production Technology
- Industrial Machinery Maintenance Technology
- Machining Technology



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Post secondary vocational

- Automation & Production Technology
- CNC Production Specialist
- Industrial Machinery Maintenance & Repair
- Machining Technologies
- Mechatronics
- Welding technologies



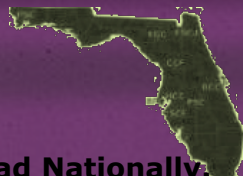
State /Community colleges

- A.S. Engineering Technology
- A.S. Manufacturing Technology
- CCCs CNC machining (various 12 -20 c.h.)



State Colleges & Universities

- B.S. Engineering Technology
- B.A.S. various (2+2)
- B.S. Mechatronics (Purdue)



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2016-17-FRAMEWORKS

2015-16 CTE Curriculum Frameworks

2016-17 CTE Curriculum Frameworks

Apprenticeship Programs

CAPE – Postsecondary

CAPE – Secondary

Career & Adult Education Technical Assistance Papers

Carl D. Perkins Resources

College & Career Planning

CTE Homepage

CTE Program Resources

CTE Staff

Manufacturing



For more information about these curriculum frameworks, contact Education at 850-245-9015.

[Manufacturing Home](#)

Middle School Courses

- [Fundamentals of Manufacturing \(9260400\)](#)
- [Introduction to Manufacturing \(9260350\)](#)
- [Introduction to Manufacturing and Career Planning \(9260360\)](#)
- [Orientation to Career Clusters \(8000400\)](#)

Secondary Courses/Programs

- [Automation and Production Technology \(9200100\)](#)
- [Biomedical Equipment Technology \(9204100\)](#)
- [Electronic Technology \(8730000\)](#)
- [Engineering Assisting \(8743000\)](#)
- [Industrial Biotechnology \(8736000\)](#)
- [Industrial Machinery Maintenance Technology \(9204300\)](#)
- [Machining Technology \(9202100\)](#)
- [Major Appliance and Refrigeration Repair \(8706000\)](#)
- [Maritime Repair/ Refinishing Technology \(9202200\)](#)
- [Welding Technology Fundamentals \(9204400\)](#)

PSAV Programs

- [Automation and Production Technology \(J100100\)](#)
- [Biomedical Equipment Repair Technology \(J400100\)](#)



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Aligning credentials

I.

- Use **Critical Work Functions** to define program

II.

- Match **Key Activities** to Course Learning Outcomes

III.

- Add Courses to address **Key Activities**

IV.

- Use **Performance Criteria, Conditions, Statement of Assessments and Related Skills and Knowledge** to Develop Assessments

V.

- Sequence **Occupational Skills & Knowledge** Relative to Learning Outcomes

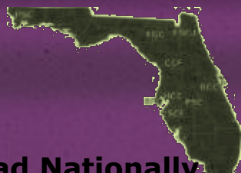
VI.

- Integrate **Academic and Employability Knowledge and Skills** as with SCANS Competencies

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Alignment of industry certifications to Florida frameworks

12 month cycle

Credentials submitted for consideration

From Industry & CareerSource

Validated approved credentials passed to FLDOE for review

Articulation agreements developed for # college credit

Colleges determine alignment of course outcomes to credentials



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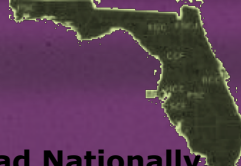
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Manufacturing credentials on Florida's funding lists

- AutoDesk
- Solidworks
- MSSC – Manufact. Skills Standards Council)
- AWS – (American Welding Society)
- NIMS – (National Metalworking Standards)
- NCEER – (Nat Council Construction Ed & Res)
- IHK – (German Chamber of Commerce)
- ETA - (Electronics Training Association)
- ISCET- (International Soc. of Certified Electronics Tech)



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FLATE's *Manufacturing* pathways



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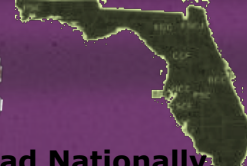
NIMS Alignment to Florida Frameworks



[Link to FDOE Manufacturing cluster home page](#)

***NOTES to Educators and Users of the Alignments and Crosswalk Documents*

FLORIDA SECONDARY LEVEL ALIGNMENTS/CROSSWALKS	FLORIDA POST SECONDARY LEVEL ALIGNMENTS/CROSSWALKS
Link to current FLDOE Secondary Machining Technology Framework	Link to current FLDOE Post Secondary Machining Technology Framework
Secondary Machining Technology Framework alignment and crosswalk to NIMS credentials	Post Secondary Machining Technology Framework alignment and crosswalk to NIMS credentials
Secondary "High Level" Machining Tech-NIMS Alignment (alignment summary)	Post Secondary "High Level" Machining Tech-NIMS Alignment (alignment summary)
FLORIDA A.S. LEVEL ALIGNMENTS/CROSSWALKS	
Link to current FLDOE AS ET Degree Frameworks (w Mechanical Fabrication & Design specialization)	
ET Degree Mechanical Fabrication and Design Specialization alignment and crosswalk to NIMS credentials	
Links to current FLDOE Frameworks for College Credit Certificates (CCCs) under Mechanical Fabrication and Design Specialization: CNC Machinist / Fabricator (CCC – 0648051002) CNC Machinist Operator / Programmer (CCC – 0615000015) Mechanical Designer and Programmer (CCC – 0615080503)	
CCC-NIMS alignment files: CNC Machinist Operator CCC alignment and crosswalk to NIMS credentials CNC Machinist-Fabricator CCC alignment and crosswalk to NIMS credentials Mechanical Designer and Programmer CCC alignment and crosswalk to NIMS credentials	
Florida AS ET Degree "High Level" Alignment (alignment summary)	
FLORIDA CAPE FUNDING LISTS and STATEWIDE ARTICULATIONS	



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AWS Alignment to Florida Frameworks



FLORIDA DEPARTMENT OF
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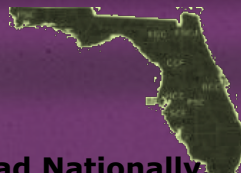
American Welding Society



[Link to FDOE Manufacturing cluster home page](#)

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FLORIDA SECONDARY LEVEL ALIGNMENTS/CROSSWALKS	FLORIDA POST SECONDARY LEVEL ALIGNMENTS/CROSSWALKS
Link to current FLDOE Secondary Welding Technology Framework	Link to current FLDOE Post Secondary Welding Technology Framework
Link to current FLDOE Post Secondary Advanced Welding Technology Framework	
Secondary Welding Technology Framework alignment and crosswalk to AWS credentials with High "Level" alignment summary	Post Secondary Welding Technology Framework alignment and crosswalk to AWS credentials with "High Level" alignment summary
	Post Secondary ADV Welding Technology Framework alignment and crosswalk to AWS credentials with "High Level" alignment summary
FLORIDA CAPE FUNDING LISTS and STATEWIDE ARTICULATIONS	
FLDOE Website for CAPE Certification Lists (Secondary and post-secondary) and statewide articulations	
NEW!!	
FLATE Best Practice Guide for Aligning Curriculum to Frameworks	



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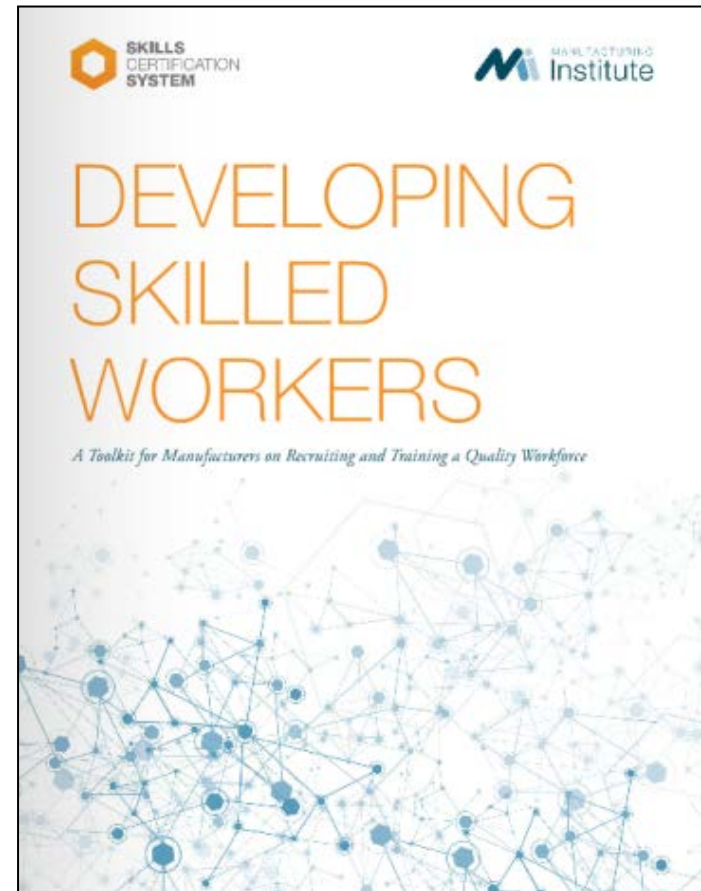
LESSONS LEARNED

Lessons learned

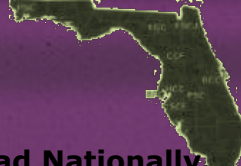
- Be sure efforts are **employer-driven**
- Find a **champion**
- There is **no “one size fits all”** approach
- **Expand** a good program
- **Brand** outreach
- Persist

What employers can do

- Prefer certifications as part of the hiring/promotion processes.
- Ask education partners to deliver nationally certified students.
- Provide work-based learning opportunities for students.



<http://www.themanufacturinginstitute.org/>



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Thank you!

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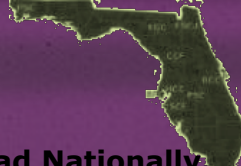
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