



Celebrating 20 Years
1988-2008



AMERICA'S 21st CENTURY LEARNING SYSTEM

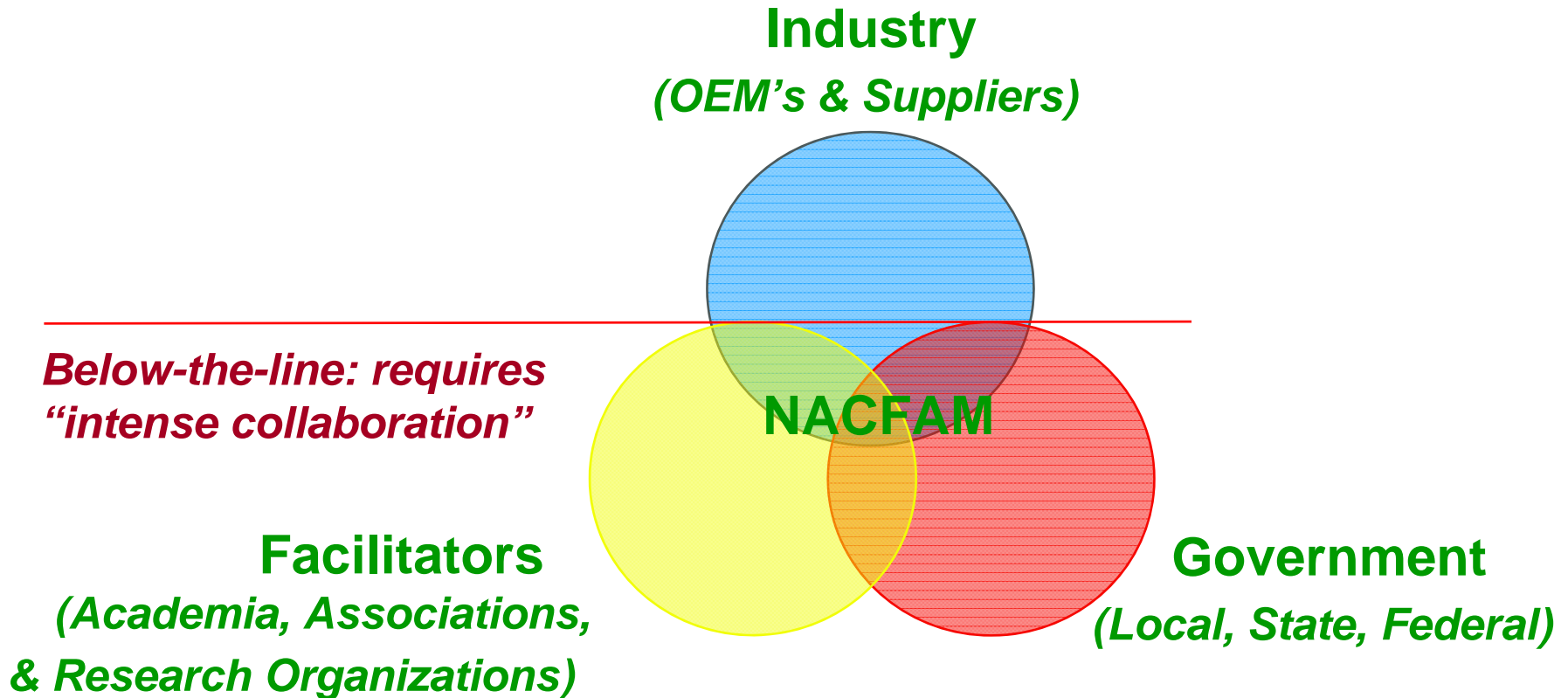
NCATC 20th Anniversary Conference, October 1, 2008

Eric Mittelstadt, CEO, NACFAM



NACFAM's Mission

**To Broker the “Intense Collaboration” Required
to Strengthen U.S. Manufacturing**



Sample of NACFAM Members

Industry

Research Centers



Research Universities



Associations

Community Colleges

Federal Agencies



NACFAM Scenario for U.S. Manufacturing

Sustainable and globally competitive based upon innovative practices & policies that continue to “Raise the Playing Field”

**Advanced
Manufacturing
Technologies
& Processes**

**Network
Centric
Strategies**



Raising the Playing Field
Innovation to Commercialization
Superhighway

**Workforce
Development &
Life-Long Learning**

**Sustainable
Manufacturing
Initiative**

Solving Tomorrow's Challenges:

Complex Societal Challenges Include:

- **Energy, Water, Food, Health Care, Infrastructure, Defense, Environment, Etc.**

Solutions must utilize more:

- **Sustainable technologies, practices & business models**

“Raising the Playing Field” requires more:

- Ability to accelerate innovative solutions into the marketplace (to the customer)
- Open & collaborative network centric business model

How can the U.S. compete?

US advantages:

- **Ability to Innovative**
- **Ability to Commercialize**
- Collaborative Innovation, **Sustainability**, GCM/NCM, High Skills, New Technologies, Entrepreneurialism, Infrastructure, Financial Capital

Mastering and collaborating with these innovation ingredients (within a global network) becomes increasingly critical for U.S. manufacturing to remain globally competitive and **sustainable**



How do we get people to think in terms of the workforce & sustainability, to change the paradigm?

Providing Americans with the Knowledge & Skills Needed to Compete in the 21st Century Economy

***“A highly skilled workforce is the lifeblood of any successful company, industry, or national economy.*”**

***The U.S. has been the breeding ground for the world’s most innovative economy, companies, and products in large part because it offered a diverse pool of talented, highly educated workers.*”**

But evidence of a decline is surfacing, precipitated by three gathering trends: ... an increasingly ill-prepared domestic workforce ... a steadily fewer highly skilled and educated foreign nationals ... and an aging population.”

The Problems We Face

- The U.S. education system is not keeping pace with the nation's changing education needs and is not providing students and workers with the knowledge and skills needed to compete in the 21st century hyper-competitive global economy.
- For American students and workers to function successfully in the 21st century global economy, their knowledge and skills must be built on world-class academic standards.
- Too many middle and high school students lack the reading, writing, and STEM skills they need to succeed in college, compete in the workforce, or even understand their daily newspaper.
- Too many twelfth grade graduates never enroll in postsecondary programs even though about 67% of today's new jobs require some postsecondary education or training.
- More than 80% of companies responding to a study conducted for the National Association of Manufacturers (NAM) indicate their members are experiencing a "shortage of qualified workers," making it difficult for them to achieve production levels, increase productivity, and meet customer demands.

NACFAM Policy Recommendations

Establish our Learning System built on six basic principles:

1. Promote and support the adoption of appropriate, validated, and rigorous world-class learning standards, assessments, and curricula for Pre K – 16 students.
2. Include applied learning in curricula for students in grades Pre K – 12, leveraging business/education partnerships to ensure workplace-relevant learning.
3. Require all graduating high school students to demonstrate mastery of academic and workplace competencies outlined in the ETA Competencies Model.
4. Strengthen career counseling for students in grades 7-12 to help ensure that graduates gain access to postsecondary schools or productive employment.
5. Assist members of the adult workforce master nationally-recognized academic & workplace competencies & upgrade and/or acquire new skills to remain in productive employment for as long as they wish to do so for lifelong learning.
6. Periodically rethink and change existing learning paradigms.

NACFAM Policy Recommendation Specifics

1. Promote & support adoption of appropriate, validated, and rigorous world-class learning standards, assessments, and curricula for Pre K-16 students.
 - Ensure that Pre K-16 learning is based on world-class learning standards, including more focus on STEM, that clearly define the knowledge and skills all students need in the 21st century to succeed in postsecondary schools and/or the U.S. workforce.
 - Develop world-class assessments to measure students' performance against world-class learning standards, allowing graduates to demonstrate they have the knowledge and skills needed to qualify for entry into postsecondary schools and/ or 21st century jobs and careers.
 - Ensure that all students have access to rigorous curricula providing them with learning experiences that prepare them for entry into postsecondary schools and/or 21st century jobs or careers.
 - Align learning standards, assessments, and curricula with postsecondary and workforce expectations of what graduates should know and be able to do.

NACFAM Policy Recommendation Specifics

1. Promote and support the adoption of appropriate, validated, and rigorous world-class learning standards, assessments and curricula for Pre K - 16 students (continued)
 - **Provide states with incentives to align their curricula, assessments, accountability systems, teacher preparation and accreditation, and graduation requirements to meet changing world-class learning standards and international benchmarks.**
 - **Require teachers in grades 7-14 to be credentialed in the subjects they teach.**
 - **Amend teacher certification regulations to permit the certification of expert private sector volunteers, retirees, and retired military members.**
 - **Review and update standards, assessments and curricula periodically to keep them current with the changes taking place in the 21st century economy.**

NACFAM Policy Recommendation Specifics

2. **Include applied learning in curricula for all Pre K – 12 students, leveraging business/education partnerships to ensure workplace-relevant learning activities.**
 - **Helps students succeed in school by understanding the relevancy of how learning can be applied to life beyond school.**
 - **Allows students to test academic theories through real world applications.**
 - **Permits students to process new information so that it makes sense to them in their own frames of reference.**
 - **Enhances students' interest and achievement in learning by making connections between new information and real-life experiences.**
 - **Recognizes learning is a complex and multifaceted process that goes far beyond drill-oriented, stimulus-and-response methodologies.**
 - **Encourages increased employer involvement in business/education partnerships and the use of employer tools and equipment in K – 12 schools.**

NACFAM Policy Recommendation Specifics

3. Require all graduating students to demonstrate mastery of both academic and workplace competencies
 - Represents the knowledge, skills, and abilities that serve as the foundation for success for high school graduates no matter what their choice of career or continuing education.
 - Provides students with the rigorous academic and workplace competencies needed to succeed in post-secondary learning or jobs and/or careers after graduation from high school:
 - Academic competencies include mastery of subjects such as reading, writing, math, science & technology, listening & speaking, critical & analytic thinking, active learning and basic computer skills.
 - Workplace competencies include mastery of skills related to teamwork, adaptability, planning & organizing, creative thinking, problem solving & decision making, working with tools & technology, sustainability, workplace computer applications, checking/examining/recording, scheduling & coordinating, and business fundamentals.

NACFAM Policy Recommendation Specifics

4. Strengthen career counseling services for students in grades 7- 12 to help insure that graduates gain access to postsecondary schools or productive employment.
 - Enhance career counseling for all middle and high school students so they know and understand the options they have for entering postsecondary education and/or the world of work.
 - Assist all high school students develop and implement career plans that identify postsecondary education and/or employment opportunities following graduation.
 - Incent school systems to track graduates' progress at least five years after receiving their high school diplomas.
 - Review, evaluate, and update career counseling strategies and programs every five years to make sure students are receiving the help they need in developing and implementing their career plans.

NACFAM Policy Recommendation Specifics

5. Assist adult workforce members master nationally-recognized academic and workplace competencies and upgrade and/or acquire new skills to remain productive and employed throughout their lifetimes.
- Requires a system of lifelong learning that provides every citizen with multiple routes to learning opportunities, including all levels and/or forms of education and training.
 - Needs mechanisms that permit people to move from one skill level or form of learning to another and provides certificates of that accomplishment.
 - Requires federal and state incentives to assist adult workforce members (incumbent workers and dislocated workers) meet 12th grade literacy standards and acquire the new skills needed to qualify and hold jobs in the 21st century workforce for as long as they wish to work.
 - Requires the removal of barriers in federal and state education financial aid systems that make it difficult for part-time, financially independent, and/or nontraditional students as well as older and/or retired workers wishing to pursue lifelong learning to qualify for financial aid.

NACFAM Policy Recommendation Specifics

6. Periodically rethink and change existing learning paradigms to achieve these goals.

- Review and update these recommendations every five years to make sure they are accomplishing their objective of providing the United States with a 21st Century Learning System that effectively prepares American citizens for learning and work in the 21st century economy.
- Conduct these reviews and updates recognizing that the U.S. is a part of an ever more complex global marketplace in which the only certainty is continuous change.
- Understand that failure to improve and change learning paradigms could result in the decline of the United States as a world economic power ... and a decline in the standard of living of many American citizens.



ISSUE #1: AMERICA'S MONEY

- The “**Green Economy**” is coming
 - McCain: “ ... Foster Rapid **& Clean** Economic Growth ”
 - Obama: “ Invest in the Manufacturing Sector & Create 5 Million **New Green Jobs** ”
 - Needed:
 - Objective recommendations to facilitate incentive-based policies to **break down barriers** to sustainable manufacturing
 - Plan to increase **sustainable manufacturing skills & jobs** for the “Green Economy”
 - Growth through **learning** & collaboration among industry, students, educators, policy-makers & more

NACFAM Can Help the Nation

- Provide objective, non-partisan policy proposals by brokering collaboration among all stakeholders in Sustainable Manufacturing & the **“Green Economy”**
- Collaborate on plan for quick & successful **workforce development** in the “Green Economy” & **Sustainable Manufacturing**
 - Use **NACFAM experience** from co-leading with AFL-CIO the first ever general Manufacturing Skills Standards &
 - Penn State Nano-manufacturing Skills Standards
- Facilitate learning & collaboration with NACFAM’s **Sustainable Manufacturing Wiki web hub**
 - Add to knowledge base about Sustainable Manufacturing
 - Increase interest in manufacturing careers
 - *Students these days want to be part of something that will change the world; **Sustainable Manufacturing** can become their motivation*

Upcoming Workforce Events

- NDIA/AIA Quarterly STEM Meeting
 - November 12-13, 2008 in San Diego, CA
- Defense Manufacturers Conference (DMC)
 - December 1-4, 2008 in Orlando, FL
- MassMEP STEM Forum
 - December 3, 2008 in Worcester, MA
- NDIA Manufacturing Workforce Symposium
 - June 2009 in location yet to be selected. Open to all.

Advanced Manufacturing Competency Model

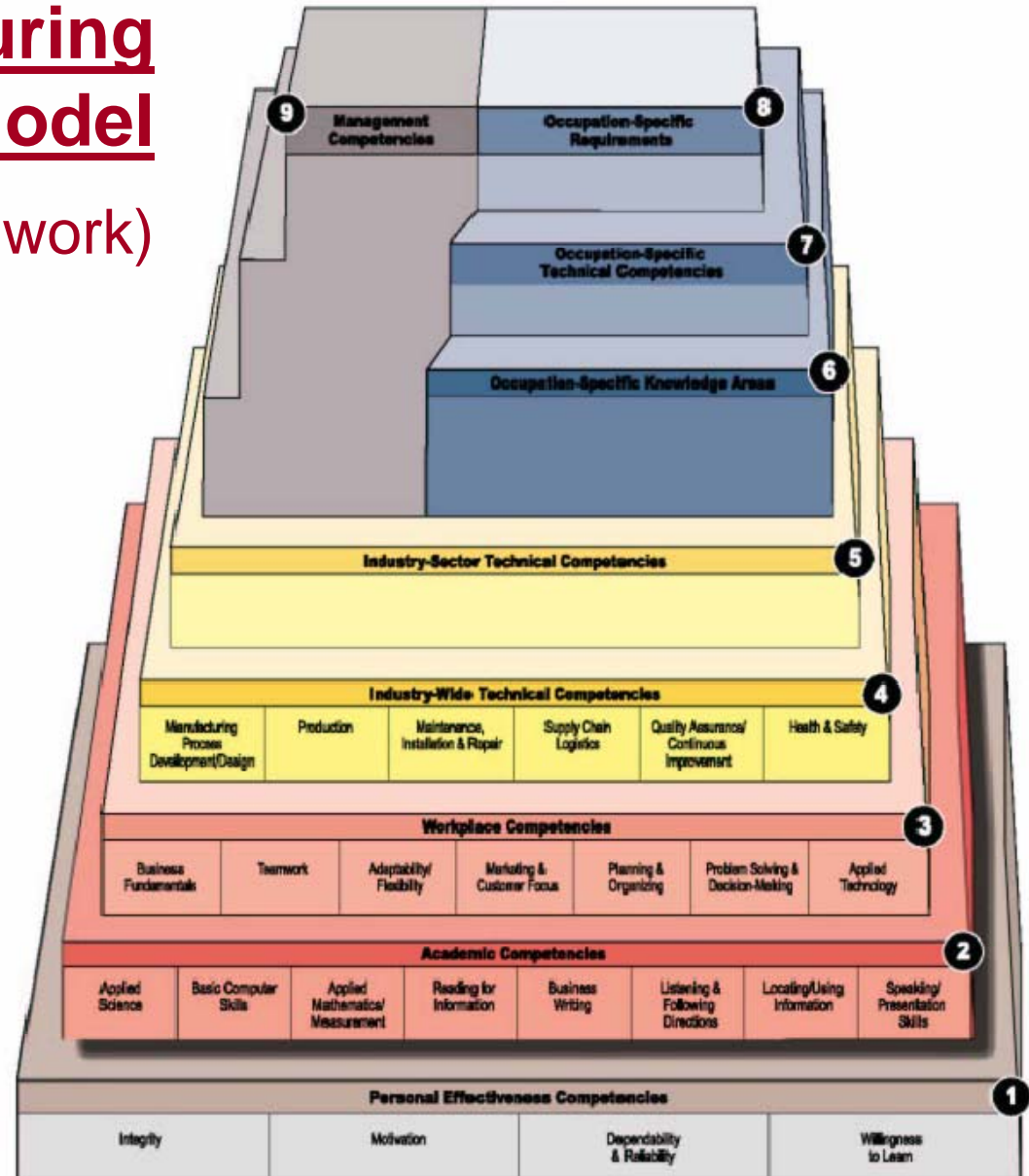
(an Industry-driven Framework)

Other Tools:

- MSSC Skills Standards
- AWS, NIMS, etc.
- DoEd Career Clusters

Framework of Competencies by the Advanced Manufacturing Industry

1/31/06





Manufacturing Cluster

Planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

Sample Career Specialties/Occupations	<ul style="list-style-type: none"> ◆ Assemblers ◆ Automated Manufacturing Technicians ◆ Bookbinders ◆ Calibration Technicians ◆ Electrical Installers and Repairers ◆ Electromechanical Equipment Assemblers ◆ Extruding and Drawing Machine Setters/Set-Up Operators ◆ Extrusion Machine Operators ◆ Foundry Workers ◆ Grinding, Lapping, and Buffing Machine Operators ◆ Hand Packers and Packagers ◆ Hoist and Winch Operators ◆ Instrument Makers ◆ Large Printing Press Machine Setters and Set-Up Operators ◆ Machine Operators ◆ Managers, Supervisors ◆ Medical Appliance Makers ◆ Milling Machine Setters, Set-Up Operators ◆ Millwrights ◆ Operators, Tenders, Cutters/Brazers, Soldering, Machine Operations ◆ Painters ◆ Pattern & Model Makers ◆ Precision Layout Workers ◆ Precision Optical Goods Workers ◆ Production Associates ◆ Sheet Metal Workers ◆ Solderers and Braziers ◆ Tool and Die Makers ◆ Welders 	<ul style="list-style-type: none"> ◆ Design Engineers ◆ Electrical and Electronic Technicians and Technologists ◆ Electronics Engineers ◆ Engineering and Related Technicians and Technologists ◆ Engineering Technicians ◆ Industrial Engineers ◆ Labor Relations Managers ◆ Manufacturing Engineers ◆ Manufacturing Technicians ◆ Power Generating and Reactor Plant Operators ◆ Precision Inspectors, Testers, and Graders ◆ Process Improvement Technicians ◆ Production Managers ◆ Purchasing Agents ◆ Supervisors 	<ul style="list-style-type: none"> ◆ Biomedical Equipment Technicians ◆ Boilermakers ◆ Communication System Installers/Repairers ◆ Computer Installers/Repairers ◆ Computer Maintenance Technicians ◆ Electrical Equipment Installers/Repairers ◆ Facility Electricians ◆ Industrial Electronic Installers/Repairers ◆ Industrial Facilities Managers ◆ Industrial Machinery Mechanics ◆ Industrial Maintenance Electricians ◆ Industrial Maintenance Mechanics ◆ Industrial Maintenance Technicians ◆ Instrument Calibration and Repairers ◆ Instrument Control Technicians ◆ Job/Fixture Designers ◆ Laser Systems Technicians ◆ Maintenance Repairers ◆ Major Appliance Repairers ◆ Meter Installers/Repairers ◆ Millwrights ◆ Plumbers, Pipe Fitters and Steam Fitters ◆ Security System Installers/Repairers 	<ul style="list-style-type: none"> ◆ Calibration Technicians ◆ Inspectors ◆ Lab Technicians ◆ Process Control Technicians ◆ Quality Control Technicians ◆ Quality Engineers ◆ SPC Coordinators 	<ul style="list-style-type: none"> ◆ Communications, Transportation and Utilities Managers ◆ Dispatchers ◆ Freight, Stock, and Material Movers ◆ Industrial Truck and Tractor Operators ◆ Logistical Engineers ◆ Logisticians ◆ Material Associates ◆ Material Handlers ◆ Material Movers ◆ Process Improvement Technicians ◆ Quality Control Technicians ◆ Traffic Managers ◆ Traffic, Shipping, and Receiving Clerks 	<ul style="list-style-type: none"> ◆ Environmental Engineers ◆ Environmental Specialists ◆ Health and Safety Representatives ◆ Safety Coordinators ◆ Safety Engineers ◆ Safety Team Leaders ◆ Safety Technicians
Pathways	Production	Manufacturing Production Process Development	Maintenance, Installation & Repair	Quality Assurance	Logistics & Inventory Control	Health, Safety and Environmental Assurance
Cluster Knowledge & Skills	<ul style="list-style-type: none"> ◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 					

America's 21st Century Learning System: How Do We Make It Happen?

- Review & seek support from trade & professional associations & national business/industry groups. (29 so far!)
- Review & seek support from Congressional & Presidential Candidates (well received by staff people already!)
- Seek support from the President-elect's transition team.
- Review & seek support from various Congressional manufacturing coalitions, task forces & caucuses (next step!)
- Recruit Champions for *The Learning System* from the leadership of the pertinent committees of the Senate and House
- Submit and seek support from the 50 state governors
- **What you can do –**
 - Use your time & talent to improve the quality of students entering your institutions
 - *STEM, Learning Standards, Competency Model, Career Clusters, Green Jobs,*
 - *Events – Participate with others and/or hold your own!!!*



For More Information, contact:

Fred Wentzel

**Vice President, Industry Relations & Workforce
Development**

National Council for Advanced Manufacturing

2025 M Street, NW, Suite 800

Washington, DC 20036

202-367-1247

wentzef@nacfam.org