

Are There Manufacturing Worker Skills Gaps In Our Region?

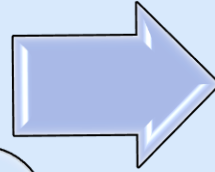
Findings Prepared for CareerEdge

Originally presented to manufacturers on July 14,
2016

Participating Manufacturers

Sarasota County

- Allied Flex Technologies, Walt Mainberger
- Adams Group, Barbara Hormann
- Atlantic Mold, Jennifer Behrens-Schmidt
- Gulf Coast Signs, Hidayet Kutat
- KHS, Jennifer Rains
- Mullet's Aluminum, Nate Yoder
- Octex, Kristin Smith
- PGT, Brian Lingle
- PPI Technologies, Stuart Murray
- SAMA, Peter Straw
- Sun Hydraulics, Greg Glass
- Cavanaugh Company, Jim Cavanaugh
- Tervis, Alicia Larkins
- Weber Manufacturing, Sam Prost



Manatee County

- Air Products, Mark Evans
- Marine Concepts, Matt Chambers
- Pierce Manufacturing, Donna Peregoff
- Teak Decking, Michael Havey
- VeeThree Electronics, Bill Allen
- xByte Technologies, Dianne Callis

**30 Minute
Telephone
In Depth
Interviews
N=20**

- **CEO/Owner/President (8)**
- **Human Resources Manager (8)**
- **Plant or Engineering Manager (3)**
- **Marketing Manager (1)**

Research Objectives

**Persisting
skills
gaps?**

- **Are manufacturers experiencing skills gaps?**
- **For what types of skills?**
- **How are they coping today?**
- **What are the causes?**
- **What are the solutions?**

The Skills Gap

The Problem

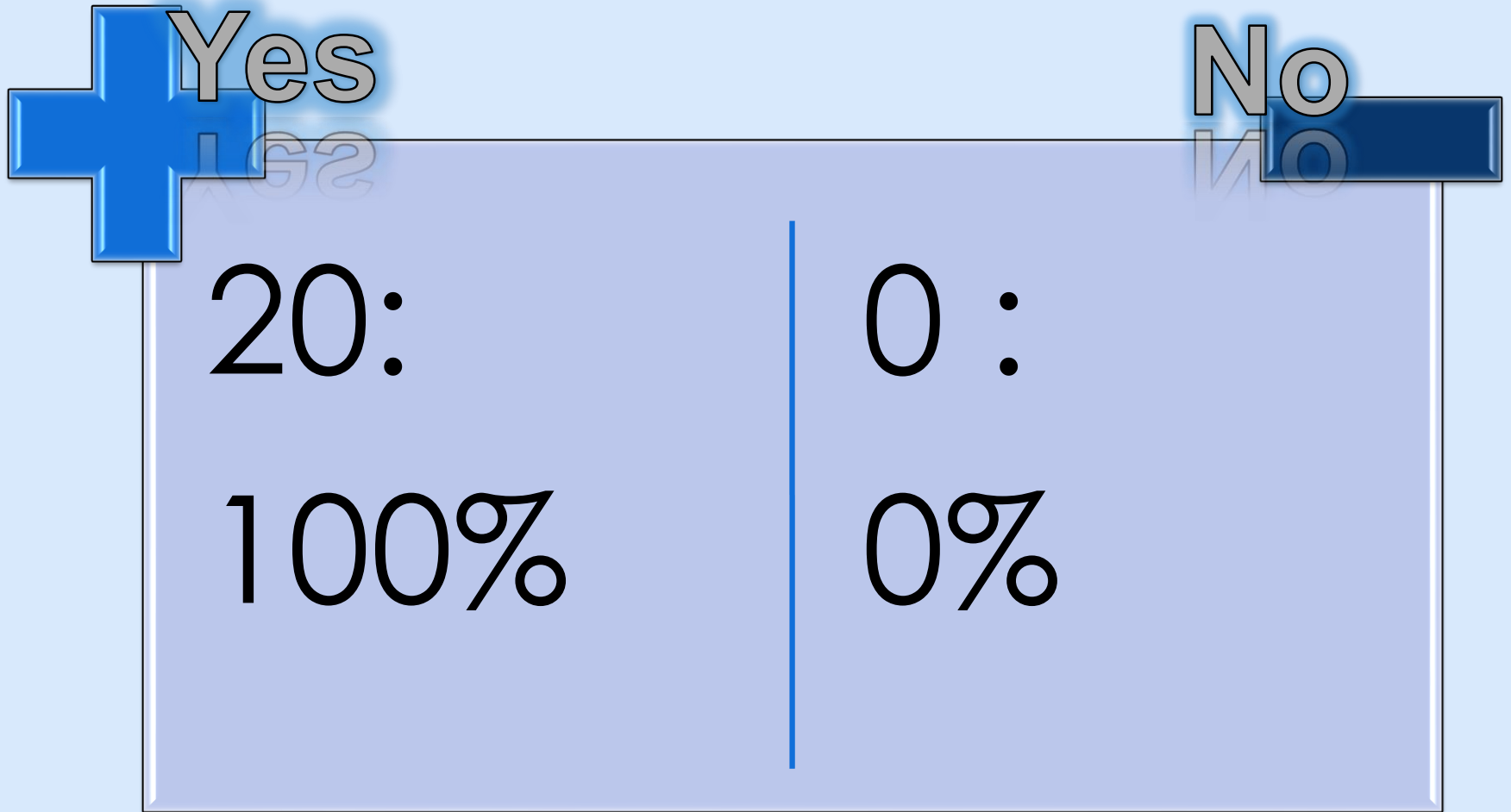
Possible Causes

Recommended Solutions

The Problem

Are you currently experiencing a skills gap for workers in your business?

100% of Manufacturers Say There Is a Gap!



*Are you currently experiencing a skills gap for workers in your business? **If yes, please describe the specific skills.***

Skills Needed – Sarasota County

Manufacturer	Needed Skills
Atlantic Mold	Coordinate Measuring Machine (CMM) Programming (Quality Inspection), Industrial Equipment Repair and Maintenance (Not Operation), Industrial Sheet Metal Fabrication (Steel or Aluminum)
Tervis	Quality Engineering and Auditing, IT Business Analysts
Adams Group	Wood Machining, Solid Surface Fabrication, Metal Finishing, Finish Carpentry, Mechanical Engineering, Project Management, Soft Skills
PGT	Industrial Maintenance, Facilities Maintenance, Tool and Die Makers, CNC Machining, Skills Trade: Electricians, Carpenters, Plumbers, Soft Skills
Sun Hydraulics	CNC Machining, Soft Skills
Gulf Coast Signs	Fabricating (with Aluminum Welding), Painting, Crane Drivers, Soft Skills

Skills Needed – Sarasota County

Manufacturer	Needed Skills
Cavanaugh	CNC Machining, Tool and Die Making, Sales, Basic Skills, Shop Skills
Mullet's Aluminum	Project Managers, Soft Skills
Weber	Brown & Sharpe Machining, Basic Skills, Soft Skills
Allied Flex	Machine Design and Assembly, Machine Control Systems and Programming
SAMA	Predictive and Maintenance Analytics, Quality Assurance, Logistics, Precision Machining, Welding
Octex	Managerial, Process Technicians (Change out molds on machines), CNC Machining
PPI	Programmable Logic Programmers (PLP), Soft Skills, Basic Skills (Mechanical and Electrical)
KHS	Electrical Assembly, Panel Building (Electronic Components), Mechanical Engineering (OEM), Welders, Machine Assembler, Basic Skills (Mechanical Aptitude)

Skills Needed – Manatee County

Manufacturer	Needed Skills
Pierce	Brake Press Operating/Machining, Aluminum (Not Steel) Welding, Metal and Welding Fabrication, Basic Skills, Soft Skills, Shop Skills
Marine Concepts	CNC Machinists (Five Axis), Carpenters, Laminators, Mold and Plug Detailers (New mill coming soon), Basic Skills, Soft Skills
Air Products	Craft People, Welders (Aluminum), Manufacturing Technicians, Soft Skills
Teak Decking	Soft Skills and Basics of Manufacturing
VeeThree	Soldering (Electronic), Design and Build Shop People, Soft Skills
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Foundational
Skills



Soft Skills



Technical Skills



Foundational Skills

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Basic/Foundational Manufacturing Skills

- Students lack a basic manufacturing skills set in skills like **mathematics** and **blueprint reading**
 - *“Schools aren’t teaching enough blueprint reading. Welders need to pass some assembly required blueprint reading and they struggle with that.”*
 - *“The fundamental math skills, the adding of fractions and numbers. Those types of things would be very basic among all manufacturing companies.”*

Basic Trade Skills

- Students lack a **basic trade skills set**
 - *“Being able to use tools, screwdrivers, drills, saws, these types of things should be common ground.”*
 - *“We have been able to find people that might be able to design and engineer parts and people who can run a mill but there are very few old shop people who can look at something, design it and transform it into an actual piece.”*

No More Shop Classes

- **Basic shop classes** aren't being taught in middle and high school
 - *“When I was in school you had home economics and wood machining. You learned the basics of equipment like that and then shop was called shop. They cut this off years ago.”*

Don't Understand Manufacturing Business

- **Business basics** like taxes and payroll are not understood
 - *“They think it’s money the company is taking. They don’t understand it is taxes.”*



Soft Skills

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No Manufacturing Mindset

- Students have an **unrealistic mindset** for manufacturing jobs
 - “They think they can make \$30 an hour immediately. They get that after experience. **They need to have a mindset of the types of jobs available.** Schools are not facilitating this mental skill set.”
 - “They are looking for a job that doesn’t exist and when there is a job that does exist they don’t want to take it. You have to get them exposure to it so they have a passion for it.”

No Manufacturing Mindset

- High schools are not doing enough to put kids on **vocational pathways** to manufacturing early enough
 - *“In Pennsylvania when you get to tenth grade you choose whether you’re heading down the academic path or going vocationally. They’re not plugging those kids in early enough. They wait until they’ve graduated high school and then decide and it’s too late.”*
 - *“I think we need to show these young kids that you can work in manufacturing and be successful and make a lot of money doing it.”*

No Manufacturing Mindset

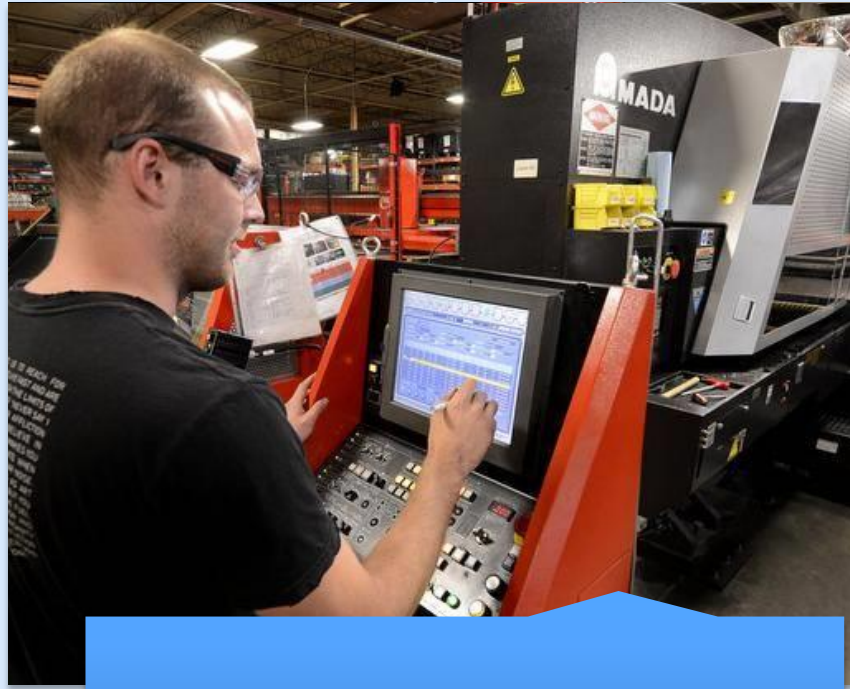
- High schools and parents in our region are not showing kids the **incredible opportunities** they have in manufacturing
 - *“The Florida mindset that you go to school to be a doctor or lawyer comes from parents. It is difficult to break. These kids don’t know they can make \$150K as a programmer with a two year degree.”*

Lack of Communications Skills

- Candidates **don't know how to present** themselves
 - *“It is amazing how many young people come through the door who have not learned resume building, application filling out and how to interview.”*
 - *“Younger workforce needs to learn communications, professionalism and respect. Time management, emotional EQ, face to face communications. These are lacking.”*

An Ethics And Values Gap?

- A **high turnover rate** of existing workers who can't maintain their regular work schedule
 - *"It is difficult to find the people who have the quality and character of a work ethic and commitment to company. We have mandatory overtime and this impacts retention. They can't maintain the pace"*
 - *"You could have all the CNC machinists in the world, but if they don't know they need to be at work everyday it doesn't matter. 95% of people fail here because they can't maintain their work schedule."*



Technical Skills

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CNC Machining Is Still The Top Needed Skill

- Many manufacturers have hired graduates from the program
 - *“I appreciate the machining section of STC because it is very helpful to our industry as a whole. I will be from time to time tapping those students for employment but we only have 17 employees so we are smaller.”*
 - *“We have needed precision machining and we are locally beginning to see these machinists. We do apprenticeship training with graduates. This program is fulfilling the gap for our company.”*

Manufacturers Needing This Skill



Machining

- Adams
- PGT
- Sun
- Cavanaugh
- Weber
- Pierce
- Marine Concepts
- Octex

Improvements Can Be Made...

- Need **more CNC machining** skills
 - *“They are doing a great job but instead of having 15-20 enrolled in that class, even more would be great.”*
 - *“STC is doing a good job training them, we just need more people in those fields.”*

Improvements Can Be Made...

- Need to **teach CNC machining skills earlier**
 - *“If we can engage the students earlier that know they are not going to college (10th or 11th grade) that there is an option to go to a precision machining class in the afternoons while you’re in school, that would gain in a huge magnitude and expose them to a manufacturing career potential.”*

Improvements Can Be Made...

- Need **more specialized CNC machining** skills
 - “We did not take advantage of the program, it is the wrong type of CNC. We are **five axis**. That program is lathe.”
 - “We have a **Brown and Sharpe mill** which requires different skills than using CNC machine controls. It is more hands on. These people need to have a a mechanical background but are more interested in working with their hands than with CNC controls. It has been our responsibility to train them because people are not going to put old technology into their manufacturing.”
 - “The machining classes available in the local schools are mostly for metal machining and not **wood machining**.”

Top Technical Skills Needed



Fabricating

- Solid Surfaces
- Metal and Wood



Welding

- Aluminum, not Steel



Design and Assembly

- Electronics
- Machine



Industrial Equipment Maintenance

Manufacturers Needing This Skill



Fabricating

- Atlantic Mold
- Adams Group
- Gulf Coast Signs
- Pierce

Metal and Solid Surface Fabricating

- “Pulling someone from machining would just be getting a mechanical aptitude. Fabrication is a different skill set. **Sheet metal work** is needed. There is a need for 20 certificate trained fabrication specialists.”
- “You don’t see many people for **solid surface fabricating**. We are constantly running ads for experienced solid surface fabricators and it is actually very rare to find one.”
- “**Metal fabrication** is not being taught here in the air conditioning program. We need people working with metal who can cut and put it together.”

Manufacturers Needing This Skill



Welding

- Gulf Coast Signs
- KHS
- Pierce
- Air Products

Aluminum (Not Steel) Welding

- “If you find someone who has **aluminum welding skills**, that person will have a good career at Gulf Coast Signs for years to come.”
- “We have a need for **aluminum welding**. Right now we are just getting steel welders.”
- “(Air Products) We cannot find people with the welding experience we want. It is more difficult to teach welding skills on the job because you have to **work with aluminum**. It is easier if they have the background.”

Manufacturers Needing This Skill



Design and Assembly

- Allied Flex
- KHS
- VeeThree
- xByte

Electrical Design and Assembly

- “It is hard to find **electrical assemblers**, people that have experience doing panel building for electronic components.”
- “Hardware is left off the curriculum and mostly what they learn is software. We need people who know **how to build** server equipment. It is a niche market.”

Machine Design and Assembly

- “We also have a need for **machine assembly**, the one reading schematics and drawings and then being able to put together the machines.”
- “There is no machine design stuff going on. There’s a lot of people learning to run machines but not that much of how to **assemble machinery**.”
- “People being able to look at something, design it on AutoCAD and then being able to take it and transform it to an actual piece building it on a lathe.”

Manufacturers Needing This Skill



Industrial Equipment Maintenance

- Atlantic Mold
- PGT
- Pierce

Industrial Equipment Maintenance

- *“I think nearly every manufacturer in this region needs this and would hire for it. Right now they are outsourcing but the preference would be to hire employees to do this work.”*

Additional Technical Skills Needed



Quality Inspection & Engineering

- Atlantic Mold
- Tervis



Tool & Die Making

- Cavanaugh
- PGT



Programming

- PPI (Programmable Logic)
- Allied Flex

The Problem

Possible Causes



Why The Gap?

Supply

- Students don't know about or have a passion for manufacturing opportunities
- No foundational skills
- Offshoring

Demand

- Aging work force

Reasons For The Gap: Lack Of Supply

- Students don't know what they don't know about manufacturing
 - *"The area we're in, our families are unfamiliar with manufacturing and there are no pathways in high schools."*
- Candidates lack foundational skills
 - ***"There is a drought of any viable labor foundational force with a skill and aptitude toward the skills trade. This puts an undue burden on companies to bring them up to speed. We can't keep up with demand."***
- More manufacturing has moved offshore
 - *"Skilled workers are not good in this country and are not being renewed because manufacturing is being spawned outside the U.S."*

Reasons For The Gap: Aging Workforce

- Employers have an aging workforce with skills that are not being taught to today's students
 - ***“Most of the people I have are good at what they are doing but they are aging. In 5 years I’m going to lose some of these workers and there’s nothing coming down the pike to train them.”***
 - *“We have one person who might retire from the Brown and Sharpe side of our business, we need to be training for that. People are aging out of this type of equipment.”*
 - *“Five of my programmers are going to retire soon. It will be a mad rush to replace them. None of them have been local hires.”*

The Problem

Possible Causes

Recommended Solutions





Foundational Skills

Manufacturing 101

- How to read production orders
- How to work with an inventory system with many part numbers and a part numbering system
- How to develop and interpret shipping schedules e.g.. Bill of lading and other documents
- Understanding accounting and profit and loss, business basics

**HIGH SCHOOL
TECHNICAL COLLEGE**

Pathway Prior To CNC Machining

- A better foundation before they jump into CNC machining
 - *“They need to be sharper on the manual side with the speeds and type of tooling and mathematics that goes with the day to day stuff they use. It would also be great to show them not only what it takes to go to college but what it takes to go to STC.”*

HIGH SCHOOL

Design and Build Shop Skills

- *“The old shop skills like being able to look at something, design it on Auto CAD and the be able take that design and transform it to an actual piece building it on a lathe or CNC machine.”*
- *“Bring back the shop classes that used to be taught in high school and middle school.”*

**HIGH SCHOOL
MIDDLE SCHOOL**

Partner Programs

- Sun and PGT work with Junior Achievement, a middle school program, to expose them to manufacturing career pathways
- *“Fab Lab donated laser cutters and routers to G Wiz and then when they went under they bought it back. It offers digital fabrication in a small scale workshop.”*

NON-PROFIT AND PRIVATE PARTNERS

Field Trips

- Manufacturers can work directly with schools to expose students to manufacturing careers
 - *“We work with the local schools to open our doors and bring students over on a field trip to show them what manufacturing jobs are out there and the potential of making a career in manufacturing.”*

MANUFACTURERS AND HIGH SCHOOLS



Soft Skills

Generic Job Readiness

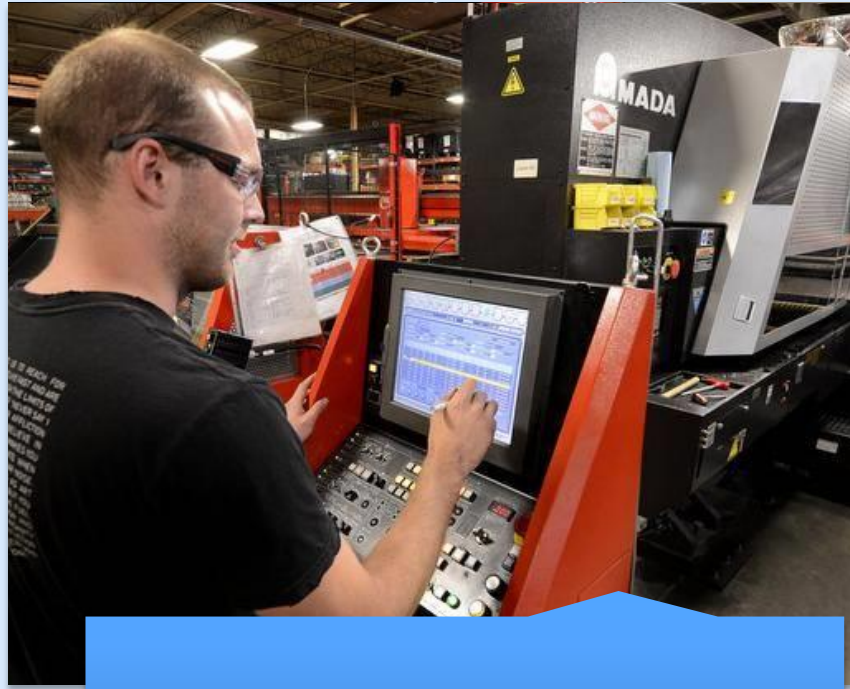
- How to write a resume
- How to prepare for an interview
- How to sell yourself
- What to wear, how to behave

**HIGH SCHOOL
TECHNICAL COLLEGE**

Computer Communications

- How to write emails
- How to set up a meeting via Outlook
- How to use a computer

**HIGH SCHOOL
TECHNICAL COLLEGE**



Technical Skills

Manufacturers Needing This Skill



Machining

- Adams
- PGT
- Sun
- Cavanaugh
- Weber
- Pierce
- Marine Concepts
- Octex

Expanding CNC Machining

- Partnership program with CNC Machining for Five Axis
 - *“The mill will come in late next year. If we know it is going to be up and running on July 1st we would want May 1st for that group to work with us for the summer and when they graduated they could come right into the mill CNC program. We are going to need 40 employees when that gets off the ground.”*

TECHNICAL COLLEGE

Wood Machining And Carpentry Apprenticeship

- *“A wood machining program would be amazing. What we are having to do is hire inexperienced people that have ability and then train them in how to do it. On the wood working side, some sort of finish carpentry program that is local.”*
- *“We would pay for tuition. They would have to commit to going and then they would enrolled with us and employed by us as apprentices for a four year period and then when they’re done they’d achieve their certification.”*

HIGH SCHOOL TECHNICAL COLLEGE

Manufacturers Needing This Skill



Fabricating

- Atlantic Mold
- Adams Group
- Gulf Coast Signs
- Pierce

Fabrication Program

- *“On the mechanical side it usually a 4 year program. I don’t know if that would be needed for a fabrication program according to the Department of Education, but the program could be one or two years in solid surfaces.”*

**HIGH SCHOOL
TECHNICAL COLLEGE**

Manufacturers Needing This Skill



Welding

- Gulf Coast Signs
- KHS
- Pierce
- Air Products

Aluminum (Not Steel) Welding Program

- *“Refinement with technical colleges is in order. They are doing just steel and it needs to be aluminum and stainless.”*
- *“What the state tells them is needed for the standard program does not involve aluminum. The current programs don’t cover what we need.”*

TECHNICAL COLLEGE

Manufacturers Needing This Skill



Design and Assembly

- Allied Flex
- KHS
- VeeThree
- xByte

Machine Design, Assembly and Controls

- Computer hardware assembly, difference between servers and personal computers (server specific)
- Reading blueprints, wiring, machine assembly, procedures to make something work and feedback to engineers
- Courses like Introduction to Controls, Mechanical Assemblies, Mechatronics (combination of mechanical and electronics) Design and Build, Electronics Soldering

TECHNICAL COLLEGE

Manufacturers Needing This Skill



Industrial Equipment Maintenance

- Atlantic Mold
- PGT
- Pierce

Industrial Equipment Maintenance

- Program which teaches students how to maintain and not just operate industrial equipment
- Manufacturers could partner with their equipment

TECHNICAL COLLEGE

Additional Technical Skills Needed



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- Atlantic Mold
- Tervis



Tool & Die Making

- Cavanaugh
- PGT



Programming

- PPI (Programmable Logic)
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Quality Assurance

- *“Companies are facing stringent quality inspection requirements. Quality inspection requirements are universal from Tervis to windows to hydraulics. There should be a quality inspection program which is a specialty certificate program which teaches dimensions and tolerances and use of inspection equipment including gauges and Coordinate Measuring Machine equipment.”*

TECHNICAL COLLEGE

Programmable Logic Programmers

- *“Our technical schools should offer a two year degree in PLP. We have had to hire these programmers from out of state. They have two year technical electrical type degrees. We train them to program on our specific machines through an apprenticeships. This region has become a packaging mecca and I know 5 or 6 other companies who could use these folks.”*

TECHNICAL COLLEGE APPRENTICESHIP

Cultivating Higher Level Skills Like Project Management

- Summit programs across manufacturers ongoing to mentor talent
 - *“Project managers need to be hired from other manufacturers or cultivated from within. We can solve this issue by having meetings where we share programs across companies and work together to hire for these positions. There could be an external program where they learn manufacturing process beyond their own specific skill.”*

SAMA

Partner Programs

- *“There are organizations like the American Composite Manufacturing Association that has a program that teaches people the basics of how composites work. We put our new hires through this so they understand the chemistry.”*
- *“Introduction to Controls, Mechanical Assemblies and Pneumatics; Packaging Manufacturers Institute offers this.”*

TRADE ASSOCIATIONS

How Are They Coping With The Gap?

Hiring from local peers

On the job training

Apprentice programs

Pulling from other industries

Internships

Hiring from other states

Partnering with schools out of area

Discussion – What Do You Think?

Skills Needed

- Do you agree? What is missing?

Outcomes

- What are the key recommendations to take back to educators and partners?

Discussion Outcomes

- Update to CNC machining program at technical colleges
 - Breakaway pathways for CNC router (wood) and brake press
- New programs at technical colleges
 - Fabricating
 - Welding (aluminum focus)
 - Machine assembly and design (also electronics)
 - Industrial equipment maintenance
- Foundational pathways and basic skill teaching earlier, at middle school level and through high school to engage parents and students for manufacturing career opportunities
- Soft skill teaching earlier in K-12 education and reinforced post secondary education