



# MANUFACTURING TODAY WI

## Manufacturing Careers in the Making

### Northwoods Manufacturing

**Page 7** — With the right equipment in place, students in Northwoods Manufacturing complete work orders from local industry partners, organizations and community members. The partnerships that have evolved are a win-win situation, notes Jacob Hostettler, metals instructor at Hurley High School. “By helping us, they’re helping themselves fill the jobs that they have in this area.”



### Denmark High School Technology Education and Engineering

**Page 10** — The Denmark High School Technology Education and Engineering department serves about 150 different students every year or about 30% of the high school population. As part of the student’s experience they can take many manufacturing skill based classes. Autumn Linzmeier, a recent graduate, shares a first-hand account of her experience and plans for the future.



### Cardinal Manufacturing — A Company of National Notoriety

**Page 19** — Cardinal Manufacturing, a student-run business, has gone from its infant stages to a company with significant annual sales and national notoriety. The growth of the program has attracted national and international attention and Cardinal Manufacturing has attended national tradeshows and hosted celebrity guests. The program has become an epitome of what can happen in any school shop, with the right blend of work and ingenuity.



### Bay Link Manufacturing

**Page 9** — Bay Link Manufacturing is a manufacturing academy located in Green Bay West High School. Bay Link is run like a business. Students are graded based on their work but also employability skills such as the ability to meet deadlines and work with others. “We wanted to do more than just teach students how to weld.”

**See More on Page 4**

**A special thank you to our sponsors and advertisers for your generous support!**

UW Platteville ♦ Northeast Wisconsin Technical College ♦ Realityworks, Inc. ♦ TLX Technologies ♦ Dream It Do It  
Dynamic Tool & Design ♦ UW Stout MOC ♦ Green Bay Packaging ♦ Waukesha County Technical College  
Wisconsin Indianhead Technical College ♦ Wisconsin Manufacturing & Technology Show  
Riverside Machine & Engineering ♦ Tri-County Communications Cooperative, Inc.

# Looking for a career upgrade?

High paying, rewarding jobs are available now for machine tool operators. Want to get one? Start here! There are still openings for fall!

## Machine Tool Operation technical diploma | 35 credits

You can start in September and graduate in May 2015  
(just 7 months!)

**\$34,000+** median annual starting salary\*

All credits transfer to CNC Technician technical diploma, so you can choose to continue your education and increase your earning potential!

## Machine Tool/CNC Technician technical diploma | 69 credits

**\$37,000+** median annual starting salary\*



**Enroll TODAY!**  
Classes start soon.

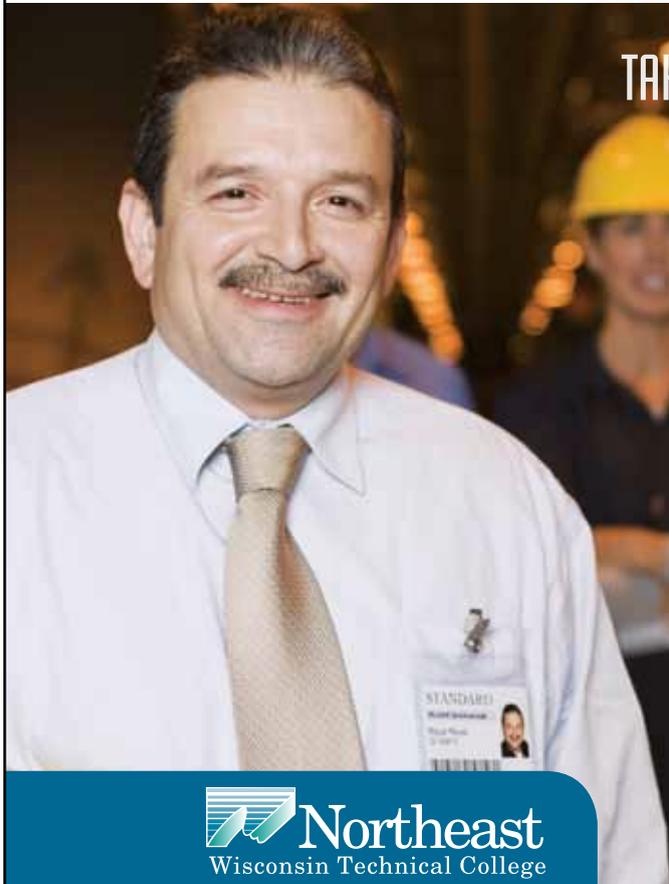


Start here.  
**GO ANYWHERE.**



[www.nwtc.edu/cnccareers](http://www.nwtc.edu/cnccareers)

\*Source: NWTc 2013-2014 Graduate Follow Up Report



TAKE **YOUR CAREER** TO THE  
**NEXT LEVEL**

### Looking to advance your manufacturing career?

With NWTc's **NEW** Marketing Operations Management associate degree, you'll learn critical supply chain, automation, quality, lean manufacturing and supervisory skills to help you transition into a leadership role.

### Working Full Time? *No problem!*

With flexible course offerings, this program allows you to work toward your degree while working at your full-time job. The 11 technical studies courses are delivered in a variety of formats. Plus, several courses are offered with a compressed 7-week schedule in which you can learn and complete assignments outside of class time.



**QUESTIONS?** Contact Janice Keller,  
janice.keller@nwtc.edu, 920-498-5459

**APPLY NOW!** Get more details or apply online  
at [nwtc.edu/manufacturingmanagement](http://nwtc.edu/manufacturingmanagement)

# RealCareer® Welding Solutions

Create effective welders more efficiently!

POWERED BY  
**Realityworks®**  
Live it. Learn it.™



Available  
in MIG  
or STICK!

NEW



## guideWELD® VR welding simulator

Enables users to master basic welding skills and learn proper technique in a safe, virtual environment. Available in MIG or STICK.

### This cost-effective system can:

- Reduce costs during the training process
- Improve muscle memory with repetitive play
- Assess and monitor weld techniques of each user



Heads-up corrective  
feedback displays

## guideWELD® LIVE real welding guidance system

Provides instant feedback on work angle, travel angle and speed with real-time heads-up guidance displays.

### This cost-effective system can:

- Allow users to correct positioning and speed
- Create quality assurance with every weld
- Give welders feedback on set MIG WPS's

## INTRODUCING Weld Defects Kit

Teach welding students how to identify and correct common weld defects and discontinuities with the RealCareer® Welding Solutions Weld Defects Kit, a portable set of weld defect models. Instructor guide, flash cards and curriculum available.



877.877.2846 | [www.realityworks.com](http://www.realityworks.com)

# Manufacturing Careers in the Making

## The Shift in Technology in Today's Welding Classroom

**Page 6** — Simulators and guidance systems like Realityworks' welding education solutions are effective because the 21st Century learning style of today's students is technology-based. With a skills gap looming, now is the perfect time to work toward sharpening skill development within welding education and redefine the way we are doing things.



## Green Bay Packaging: Innovative Thinking Since 1933

**Page 8** — "A great place to work starts with respect and trust for the people you work for. I take pride in the fact that we produce a quality product because Green Bay Packaging invests in the equipment and tools to make it happen. They also invest in us as employees with training and development." States Kay Makos, Administrative Assistant with GBP for 38 years.

## 4th Grade Class Creates PB&J Sandwich Company

**Page 9** — As students gained a general understanding of manufacturing, they began designing their own production company. Their goal was to produce PB&J sandwiches to donate to Paul's Pantry in Green Bay. Students invited approximately 20 area manufacturing leaders to come and observe the company. Students presented to the leaders on their company design and manufacturing process.



## Choosing The Career That Fits You

**Page 11** — Read about two TLX Technologies employees, Jenn — Artist and hands-on creative thinker and Alex — Process improvement aficionado, and the paths they followed towards their careers. Regardless of what career path you choose to pursue, there are many doors of opportunity available to you in manufacturing right here in Wisconsin.



## Soon to be the Big 4-0, but Dynamic Tool & Design is getting younger and younger

**Page 17** — The apprentice program at Dynamic Tool & Design is a key part of our company organizational plan and has helped us achieve 40 years of continued growth. Dynamic works closely with the Wisconsin Youth Apprenticeship program and WCTC's Dual Enrollment Program.



## GPS Education Partners Wins National Award As It Prepares For National Expansion

**Page 14** — GPS Education Partners uniquely prepares students for success in technical careers and promotes viability for business. Students journey along a pathway to master academic, technical, and character development competencies while immersed in real manufacturing settings. GPS Education Partners was honored with the prestigious Authorized Center Award.

## Cardinal Manufacturing Craig Cegielski wins National Rural Teacher of the Year Award

**Page 18** — John Hill, Executive Director of the National Rural Education Association, announced the selection of Craig Cegielski as the Monsanto Fund National Rural Teacher of the Year. Cegielski's signature achievement is the development and implementation of Cardinal Manufacturing, a student-run manufacturing enterprise within the district.

## Additive Manufacturing/3D Printing

**Page 16** — Three years ago, printing three-dimensional objects at home might have sounded like a thing out of *The Jetsons*. But in just a few short years, 3D printing has exploded — shifting from a niche technology to a game-changing innovation that is capturing the imagination of major manufacturers and hobbyists alike.



# MAKING IT IN AMERICA

U.S. manufacturers are the most productive in the world. They come from many different sectors and make the products that enrich our daily lives.



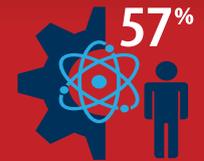
## THE MANUFACTURING WORKFORCE



EMPLOYS 12M PEOPLE



SUPPORTS 17.4M TOTAL JOBS



ATTRACTS 57% OF ENGINEERS AND SCIENTISTS

## HIGH-QUALITY CAREER OPPORTUNITIES



STEM jobs are projected to grow by 8.65M by 2018



Fields like 3D Printing and Robotics are growing



77K is the annual average salary of manufacturing workers



90% of manufacturing workers have medical benefits



Highest tenure in the private sector



Wherever you are with your career and education, there's a route for you to enter U.S. manufacturing.

### BACHELOR'S DEGREE

- Biochemists
- Human Resources
- Industrial Engineers
- Operations Managers
- Computer Programming & IT
- Production Managers
- Mechanical Engineers
- Researchers
- Sales & Marketing

### ASSOCIATE'S DEGREE

- Equipment Maintenance Technicians
- Engineering Technicians
- Semiconductor Processors

### HIGH SCHOOL DIPLOMA PLUS APPRENTICESHIP OR CERTIFICATE PROGRAM

- Assemblers
- First-Line Supervisors
- Inspectors
- Machinists
- Office Clerks
- Shipping & Receiving
- Tool Operators
- Welders & Cutters
- Heavy and Tractor-Trailer Truck Drivers

The fourth annual **NATIONAL MANUFACTURING DAY**  
Friday, October 2, 2015



Manufacturing Day is a celebration of modern manufacturing meant to inspire the next generation of manufacturers.

Join us at [www.mfgday.com](http://www.mfgday.com)

# The Shift in Technology in Today's Welding Classroom



Jamey McIntosh, Product Manager for Realityworks, Inc.

With today's evolution of new technology, classrooms all over the country are changing. As you look at the landscape of business, training, welding education and manufacturing, it's necessary to consider that with today's technological advances students can have experiences that have never been available before that can enhance their learn-

ing. One such experience is the ability to fail and learn from that failure, an experience that today's 21st century learner have because they are more willing than earlier generations to try new tasks without fear. Now, new technologies and teaching techniques can be used to train, test and evaluate today's in new ways. It is important that we look at available training tools and reflect on how they can be used. By doing this, new techniques in high-

demand fields like manufacturing and welding education may not seem as impossible to accomplish.

One company offering such training tools is Realityworks, Inc., an experiential learning company. Realityworks is at the forefront of collaboration with education to help bring hands-on, engaging, technology-based experiences and tools to 21st Century learners to ensure students have success in any career path they choose. The advanced technologies that Realityworks uses in its simulations and products help students refine their skills and capitalize on the fact that realistic situations combined with interactive technology can be a great teacher tool.

This is also true for the company's welding education solutions, the guideWELD® VR welding simulator and guideWELD® LIVE real welding guidance system. These products allow students to learn proper welding techniques, get instant feedback, make corrections and further understand the art of welding. Tools like this not only engage and educate interested students in welding careers, but help attract potential students to a field that by 2019, will need over 310,000 replacement and new welding professionals.<sup>1</sup> With a skills gap looming, now is the perfect time to work toward sharpening skill development within welding education and redefine the way we

are doing things.

Simulators and guidance systems like Realityworks' welding education solutions are effective because the 21st Century learning style of today's students is technology-based. Students are comfortable with simulations and other advanced technologies because they are used gaming technology. Thanks to the internet and social media, they're used to the immediate feedback that tools like virtual reality welding simulators and guided reality welding training tools provide; the ability to see the impact of their decisions forces them to learn and rethink efficiently.

By incorporating new technologies and teaching techniques into today's classrooms, educators can help ensure that the varying needs of today's welding students are met while simultaneously engaging them and inspiring them to follow related career paths. This shift in education could help 21st Century students to be more open and motivated to engage in learning – and perhaps the welding student who previously just wanted to get his or her weld completed will be inclined to re-create it until their technique is perfected.

<sup>1</sup> Kim, J. PH.D. (2010). The Welding Industry: A National Perspective on Workforce Trends and Challenges. Updated Welding Industry Report. weld-ed.org



Many goods are manufactured in the United States. The following list shows specific manufacturing industries, types of products that each industry makes, and the industry's 2013 employment, according to BLS.

**CHEMICALS:** This industry makes products such as fertilizers, medicines, and paint and had about 793,000 jobs.



**COMPUTER AND ELECTRONIC PRODUCTS:** Cell phones, fire alarm systems, and semiconductors are a few of the products this industry makes. There were about 1.1 million jobs in this industry.



**FABRICATED METAL PRODUCTS:** This industry makes products such as metal cookware; metal windows and doors; and screws, nuts, and bolts. It had about 1.4 million jobs.



**FOOD:** This industry makes products such as frozen fruits and vegetables, processed meats, and cheeses. With 1.5 million jobs, it was one of the largest manufacturing industries in terms of employment.

**MACHINERY:** Lawn and garden tractors, backhoes, and baseboard heating units are among the many products made by this industry, which had 1.1 million jobs.



**PLASTICS AND RUBBER PRODUCTS:** This industry makes products such as plastic bottles, plastic plumbing fixtures, and rubber tires. It had 656,000 jobs.



**TRANSPORTATION EQUIPMENT:** Cars, trucks, and motor vehicle parts are some of the products this industry makes. It had 1.5 million jobs, making it one of the largest manufacturing industries in terms of employment.



**OTHER:** Other manufacturing industries include those that make primary metals, furniture, and wood products. These remaining 13 industries together had about 4 million jobs.



Source: Bureau of Labor Statistics — [www.bls.gov/home.htm](http://www.bls.gov/home.htm)

# Northwoods Manufacturing



*Hurley School District*

Thanks to donations and support from local industry, community members, and the Hurley School District, Northwoods Manufacturing, a student-run business based in Hurley High School, opened its doors at the beginning of the 2013–14 school year.

Students learn how to develop a good work ethic, do advanced machining on metal and wood, and enter into the workforce in a manufacturing career. Northwoods Manufacturing was made possible when Hurley High School’s technical education department underwent a complete overhaul. With support from industry partners, the school purchased manufacturing equipment. Students also helped by building new work

tables and welding booths, and repainting the facility’s walls.

With the right equipment in place, students in Northwoods Manufacturing complete work orders from local industry partners, organizations and community members. Northwoods Manufacturing has a metals division and a woods division, which provide students with a variety of manufacturing experiences and its customers with a range of products and services. Examples of the products and services include: machine parts for local industries, coffee/ end tables for local furniture vendors, trailers, custom hitch plugs, grills, and fireplace mantels — to name a few.

“Our mission is to provide students with real world manufacturing experiences that will prepare them to enter the work force with production skills and work ethic to make them desirable candidates for industry,” said Teacher Roger Peterson.

At Northwoods Manufacturing, the emphasis is on “real world application.” Students are learning manufacturing skills by producing products for their business.

“This type of program has been great for student morale and skill level as they see an immediate purpose to the skills they are



being taught,” Robertson said.

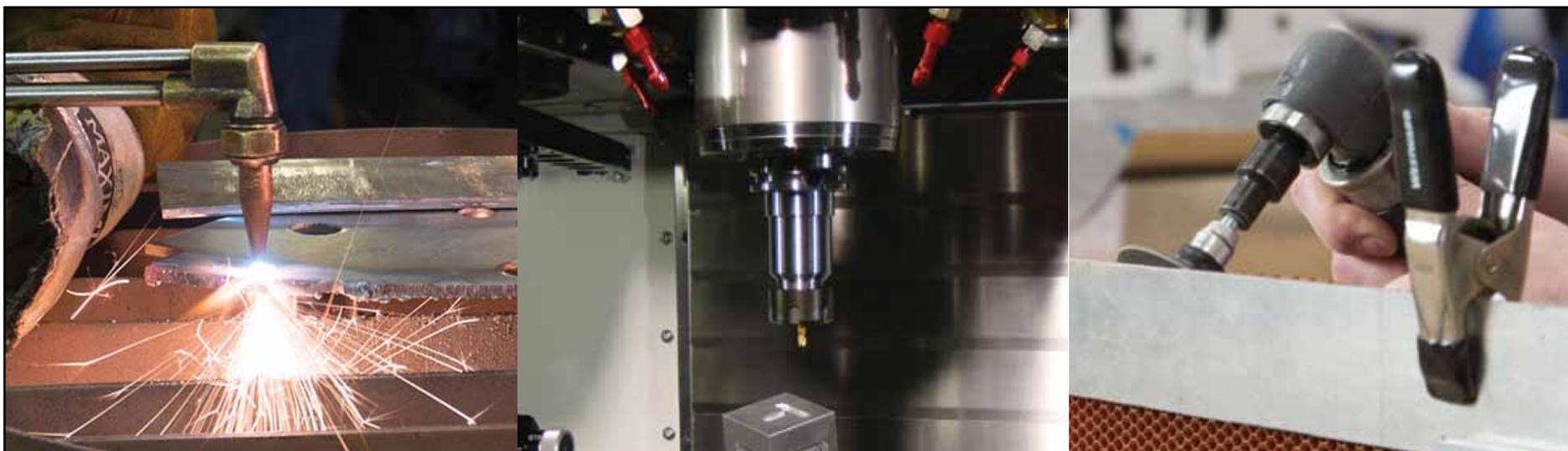
In only its second year of operation, the business is gaining recognition. In January, Northwoods Manufacturing received the 2014 Business of the Year Award from Iron County. Students and staff are continually refining their curriculum and business to find ways to make it more efficient and effective.

Northwoods Manufacturing’s early success can be attributed at least in part to Hostetler’s student teaching experience with instructor Craig Cegielski at Eleva-Strum

Central High School in the western portion of the state, which has an established student-run machine shop business called Cardinal Manufacturing.

The partnerships that have evolved are a win-win situation, notes Jacob Hostetler, metals instructor at Hurley High School. “By helping us, they’re helping themselves fill the jobs that they have in this area,” he says. “It works out for the schools, the students,

**Continued on Page 20**



WISCONSIN  
INDIANHEAD  
TECHNICAL  
COLLEGE

*Experience. Success.*

witc.edu 800.243.9482

## Get hands-on training in WITC manufacturing programs

Welding  
Machine Tool Technician  
Composite Technology  
Industrial Maintenance  
CNC Machine Tool Operation

Machine Tool Operation  
Machine Tool Technics  
Industrial Automation, Controls and Networking  
Automated Packaging Systems Technician  
Short-term technical diplomas and certificates

\*Customized training and assessment also available

WITC is an Equal Opportunity/Access/Affirmative Action/Veterans/Disability Employer and Educator.

# Green Bay Packaging: Innovative Thinking Since 1933



Green Bay Packaging manufactures high-quality products for use in a variety of commercial and retail packaging and labeling applications. The family-owned company creates and manufactures a wide range of corrugated products, folding cartons and coated label products.

The vertically integrated, financially secure paperboard manufacturing company is headquartered in Green Bay with divisions nationwide and a global presence in Mexico and Canada.

Green Bay Packaging employees are the difference maker for the company's success.

GBP invests in their employees by providing a competitive wage and benefit package, a commitment to employee safety and a training program that provides the employees an opportunity to move up in the organization.

Green Bay Packaging endeavors to live on the cutting edge of design and technology in products and process. In 1933, the company was born from invention and resourcefulness. Founder George F. Kress's vision for the company remains the same today: innovative solutions from empowered people solving specific customer challenges.

Committed to environmental aware-

ness, Green Bay Packaging has developed ways to reduce fresh water consumption and eliminate process water discharge into public waterways. Green Bay Packaging uses 75 percent less fresh water per ton of paper produced compared to other paper mills. The Green Bay Mill was one of the first paper mills in the world to institute a totally effluent-free water system with no direct discharge of process water into lakes, rivers or streams.

The Fiber Resource Division manages more than 260,000 acres of company owned timberlands. Their responsibility is to harvest trees needed for the Pinecrest Lumber Mill and wood chips needed for the Arkansas Kraft Paper Mill with a key focus on environmental responsibility and stewardship.

Responsibility is the foundation of Green Bay Packaging's corporate culture. Flat-line management throughout the company sparks creativity, results in low employee turnover, high employee engagement and allows associates to have a positive impact on customers.

Employees enjoy solving problems and are passionate about their work. Associates are encouraged to define a career path and with 30 nationwide locations, there is never



a shortage of opportunities to grow, evolve, advance and succeed.

"A great place to work starts with respect and trust for the people you work for. I take pride in the fact that we produce a quality product because Green Bay Packaging invests in the equipment and tools to make it happen. They also invest in us as employees with training and development." States Kay Makos, Administrative Assistant with GBP for 38 years.

Green Bay Packaging is a privately held company that has an excellent financial track record; is growing at a rate significantly better than the industry; has a loyal, growing workforce that is well-trained, fairly compensated and ready for the future; is committed to both the environment and the communities we live.

G R E A T  
PEOPLE. PRODUCTS. CULTURE.

*for future career opportunities*

OPERATIONS. SALES. CUSTOMER SERVICE. DESIGNERS.  
MANUFACTURING. ENGINEERS. SCIENTISTS.



GREEN BAY PACKAGING  
THE SMART CHOICE

®

## BAY LINK MANUFACTURING

A PARTNERSHIP LINKING EDUCATION AND MANUFACTURING

Shelby Anderson

The Green Bay Area Public School District undertook an extensive community engagement effort that addressed many aspects of the school district including career and technical education. Out of this effort, the district started Bay Link Manufacturing, a manufacturing academy located in Green Bay West High School.

This is the first school year that Bay Link has been in existence. Last year, juniors and seniors in the school district were invited to apply. About 15 students went through the application process, which included an interview with teachers and representatives from manufacturing companies, and 12 students were selected.

For three hours in the afternoon of each school day, the students work as a team completing orders for manufacturing companies, working on student-developed products and ideas, and developing the business. In addition to the manufacturing work, students make sales calls and visit with manufacturing leaders. Teacher Andy Belongia said the business side of Bay Link was daunting at first to students.

"You can see the confidence building in the students," Belongia said. "Now they can sit down in a conference room with representatives from

big companies."

Students earn high school credit and, through a partnership with Northeast Wisconsin Technical College, they get three college credits. In addition, some of the revenue that Bay Link Manufacturing brings in gets distributed to the students at the end of the school year in the form of scholarship money. "Students have a little stake in the game," Belongia said.

Bay Link is run like a business. Students are graded based on their work but also employability skills such as the ability to meet deadlines and work with others.

"We wanted to do more than just teach students how to weld," Belongia said. "We have a rubric of employability skills and hard skills, such as showing up on time. At the end of each grading period, students have a review just like you would have at any job."

Much of the work that Bay Link does is for larger manufacturing companies that need a small, custom job completed. Area manufacturers send blueprints to Bay Link and the students calculate how much the order would cost to produce. Students at Bay Link then send a bid sheet back to the company and wait for their response.

Belongia said an advantage of Bay Link is



that it can complete small-scale manufacturing order quickly. "Manufacturing is moving faster and faster," he said. "These companies can't wait weeks or months to get a part from overseas."

Bay Link hopes to be self-sustaining in three years. Until then, it will continue to receive support from the school district, NEW Manufacturing Alliance, Northeast Wisconsin Technical College and a host of donors.

"They know they're helping to build the manufacturers of tomorrow by working with us," he said.

For school districts that are interested in starting a manufacturing academy or student-led business, Belongia said the most important step is to make sure your school district is 100 percent supportive. Another key component is develop-

ing a relationship with a local technical college so that participating students can earn college credit while in high school. Finally, Belongia said partnerships with local manufacturing companies are essential. "You have to have someone from the manufacturing industry who will be a champion for your district."

Shelby Anderson is editor of Wisconsin School News. Reprinted with permission from The April 2015 issue

[www.gbaps.org](http://www.gbaps.org)  
(920) 448-2000



## 4th Grade Class Creates PB&J Sandwich Company



*Editor's note – This is the first time we have included an elementary school's activities in Manufacturing Today WI but we think it fits. Enjoy!*

Brillion Elementary School STEM

Mrs. Kittel's 4th grade class looked more like a manufacturing company this past week than it did an elementary classroom. During a Science, Technology, Engineering, and Mathematics (STEM) unit, students developed a production company to produce peanut butter

and jelly sandwiches. This project was the culmination of a unit on Industrial and Manufacturing Engineering.

During this unit, students read a children's book on manufacturing, studied Henry Ford and the assembly line, created an assembly line to make file folders, and did research presentations on local manufacturing companies.

As students gained a general understanding of manufacturing, they began designing their own production company. Their goal

was to produce PB&J sandwiches to donate to Paul's Pantry in Green Bay. Students first custom made the sandwiches, then took statistics on the quality, and then began refining the process. Students created a flow process chart to map the value stream, purchased more effective tooling such as spatulas for spreading peanut butter and pizza cutters for cutting the sandwiches, and rearranged the facility to balance the line and create a more efficient flow. Concepts covered included Lean manufacturing principles, Kaizen events, quality control, Kanban, time motion studies, etc.

Once students refined their process they were open for business. Students invited approximately 20 area manufacturing leaders to come and observe the company. Students presented to the leaders on their company design and manufacturing process. The adults, however, were in for a surprise: the students then trained the visitors on a process and put them to work! Dressed in aprons, gloves, and hairnets, the students and visitors produced approximately 100 PB&J sandwiches for Paul's Pantry. A future goal is to make this a yearly project and invite other community members and manufacturing companies to participate.

In regards to working with the adults, one student said, "It was cool to show them how we do things. I thought it felt cool when we were presenting when the people said they were

amazed kids could do that. It made me feel good."

I felt some of the most exciting things about this project were the skills developed that will help students in all aspects of their learning. The obvious learning that occurred was about the manufacturing process and how to use lean principles to be as productive as possible. Some of the other valuable things I saw were students' confidence being enhanced, their ability to present in front of both classmates and adults, and their willingness to communicate with people they were just recently introduced to. These incidental lessons will give them confidence to try new things in all of their learning experiences throughout their entire lives."

If you would like to know more about this project or other STEM initiatives, please contact fourth grade teacher Cheryl Kittel at [ckittel@brillionsd.org](mailto:ckittel@brillionsd.org) or STEM teacher Steve Meyer at [smeyer@brillionsd.org](mailto:smeyer@brillionsd.org)

[www.brillion.k12.wi.us](http://www.brillion.k12.wi.us)  
(920) 756-2368



# Denmark High School Technology Education and Engineering



Kory Fredrikson  
Denmark High School  
Technology Education and Engineering  
Instructor

The Denmark High School Technology Education and Engineering department serves about 150 different students every year or about 30% of the high school population. As part of the student's experience they can take many manufacturing skill based classes. With the help of Northeast Wisconsin Technical College (NWTC) we are able to offer several dual credit classes through their train the trainer program. My first train the trainer experience coincided with NWTC's Computer Integrated Manufacturing mobile lab (CIM) I was trained in G-Code, CNC Milling Ops, and CNC Lathe Ops. That first year about 10 students earned 2 NWTC credits. Since then we have been able to offer 10 different NWTC credits across three different areas. This next school year we will

be offering G-Code(2), CNC Milling Ops, CNC Lathe Ops, SMAW, GMAW, Automation I, Automation II, Metal Fabrication, and Masonry.

This past school year we worked closely with KI to provide the students with a real life manufacturing problem. During the installation of wheels on to chair blades, some of the wheels were cracking. That was the only information given to my class. They were given two sets of chair blades, 10 wheels, and were told to go build. Over the course of the next month and several failures they finally solved the problem. Their solution was to use a pneumatic cylinder to press the wheels on. Everything but the pneumatics were manufactured by the students.

As part of this project the students had to go to KI to present their solution to KI engineers.

Autumn Linzmeier was one of the students who was a part of the KI chair project. She is a 2015 graduate of Denmark High

School. She took many Tech. Ed. classes over her four years. Below is a first-hand account of her experience:

*"It was my freshman year in high school when I discovered that working in the trades is for me. Clueless and lost, I signed up for a shop course not knowing what lies ahead. Being the only girl in the shop class did not intimidate me, it was all the planned projects that intimidated me. After completing all the projects without a problem, I realized working machines is enjoyable. Becoming highly interested in the machining trade, I researched and found some women are already in the trades. Inspired by these women, I*

*decided becoming a machinist is my dream. Machining is my dream; working for that dream is the only option. I was accepted into a program as a junior called Youth Apprenticeship. Later, in my junior year, I entered the Youth Options program. These programs allowed me to take college courses and leave school early to work and gain experience in the machining trade. At the end of my Youth Apprenticeship, I was the top student, proving myself that I can do this. Being the only girl in most of my college courses, I drew odd looks from those*

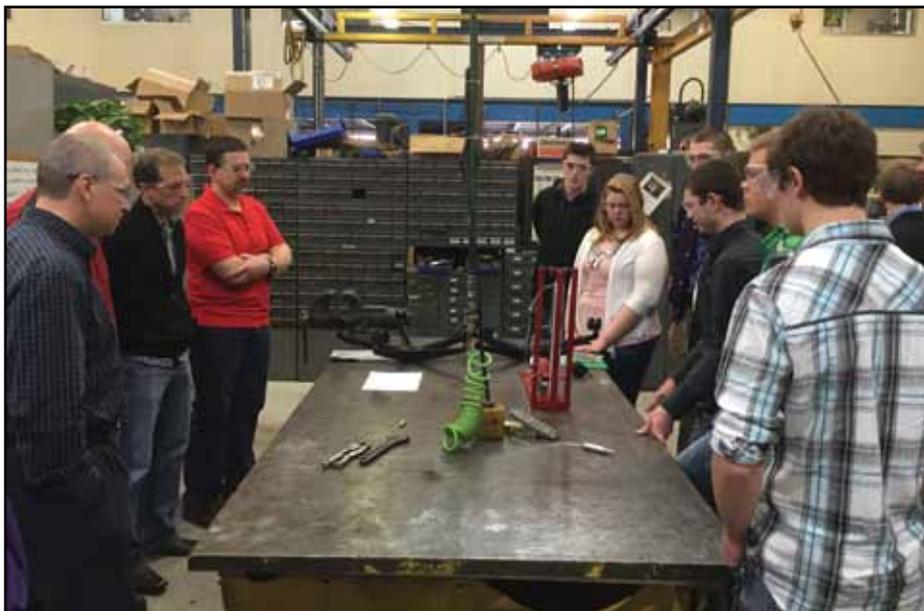
*who were not used to women working in the trades. Working in a male-dominated trade is not a change for me, it's a change for those who are not used to a female working in this trade. I'm determined to reach my goal of being a great machinist no matter what struggles need to be faced.*

*My plans for college consist of graduating top of my class in the Machine Tool- CNC Technician Program at NWTC, which I will be starting this fall. I also plan on participating in SkillsUSA in the CNC milling competition with hopes of placing 3rd or above. After completing the machine tool program, I will go on to earn my associates degree in Manufacturing Engineering, also at NWTC. I am currently working at Paper Converting Machine Company and I plan on continuing to work there as long as possible."*

—Autumn Linzmeier

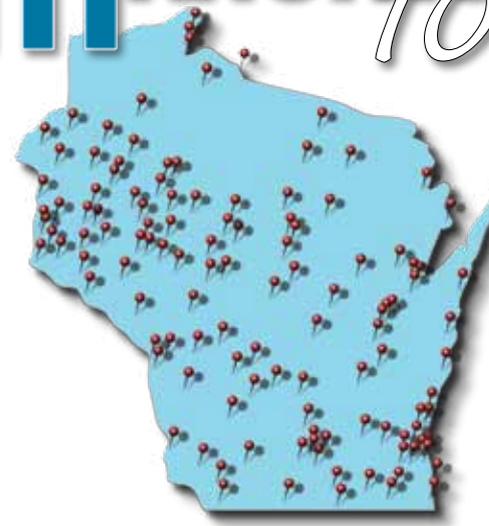
Photos by "Shellie Kappelman Photography"

[www.denmark.k12.wi.us/hs](http://www.denmark.k12.wi.us/hs)  
(920) 863-4000



## Who reads

# MANUFACTURING TODAY WI



More than  
70,000 readers  
across the state!

# Choosing The Career That Fits You



Choosing a career can be a daunting and scary proposition for many students. A few students know from an early age what they want to do for their vocation and consistently pursue that dream their whole life. Some students head off to college hoping that they will figure it out at some point. The reality is that most of us stumble into what we enjoy doing through a series of opportunities that are presented to us throughout our lives.

## Meet Jenn — Artist and hands-on creative thinker

Jenn never went looking for a career in manufacturing...it found her. As a child, she always enjoyed creating things with her hands. This eventually translated into the pursuit of an art degree in college. Once graduated, she was having difficulty finding a job in her field of study and soon found that she needed to pursue other avenues in order to provide a living. Through a friend, she found out that TLX was looking to hire a few people. In the ten years she has been with TLX, Jenn has moved into different roles gaining experience and knowledge in the various aspects of the development to production process.

So how does an art degree help someone in manufacturing? Jenn's creative thinking and desire to learn has allowed her to get involved in many stages of a product's development. She found learning about the different processes has been very interesting and challenging. Additionally, being part of the team that works to make things better and more efficient so that TLX is developing

the cleanest and leanest part has been exciting and rewarding. In her own words, Jenn said that she takes great satisfaction when she sees components get shipped out the door to the customer because she knows that they are quality products that have been developed and made exactly to the customer's specifications.

Her advice to students? Get into a small company and grow with it. Being in a smaller company provides many opportunities to gain knowledge and understanding that will help you grow both personally and professionally. ▶

## Meet Alex — Process improvement aficionado

Accounting was the original career path Alex intended to follow as an assessment test taken in high school scored him high for that field. As a result, Alex pursued a business co-op opportunity in an accounting department at a credit union when it presented itself during high school. He quickly came to the realization that accounting was not the path he wanted to pursue. However, what the test did reveal was Alex's affinity for detail and efficiency.

He also took advantage of another opportunity to attend an engineering summer camp at UW Milwaukee. During the camp he learned about all types of engineering careers, one of them being an industrial engineer. Until that time, he had no idea that there was a career that was centered on process efficiency and improvement. He realized that with an industrial engineering degree he would have many



options available to him after college. Shortly after graduating, Alex joined TLX as an engineer on the quality team.

So, what exactly does an industrial engineer do in manufacturing? Not only does Alex spend his days working with individuals on the production line to improve the process of how something is made, but he also works closely with the design engineers to incorporate quality and efficiency into the design process. Alex has been surprised at how much there is to learn about all the systems and processes that go into making a quality finished product. The constant challenge of learning and working to improve both product and processes provides endless opportunities for creativity and innovation.

His advice to students? Figure out what you are interested in and take every opportunity to learn about

that subject. If you are unsure, try as many different things as you can until you find what interests you. Lastly, don't be afraid to talk to adults who have jobs in the field you are interested in. You will find that they will be more willing than you might think to take the time to answer your questions and to talk to you about their career.

TLX Technologies is excited about the future of manufacturing here in the United States. Regardless of what career path you choose to pursue, there are many doors of opportunity available to you in manufacturing right here in Wisconsin. We would like to invite you to explore what options are available to you through classes, programs and internships available through your school or community. If you have any questions, please contact TLX at [pr@tlxtech.com](mailto:pr@tlxtech.com) or visit our website at [www.tlxtech.com](http://www.tlxtech.com).



**MANUFACTURING**  
*TODAY*  
**WI**

PUBLISHER/EDITOR: Renee Feight  
EDITORIAL: Andria Reinke  
PAGE COMPOSITION: Andrew Clausen  
WEBMASTER: Scott Bayerl  
SPECIAL PROJECTS: Allie Zacharias  
Please direct articles, advertising, questions or comments to: *Manufacturing Today WI*™  
PO Box 1704  
Eau Claire, WI 54702  
Phone/Fax 715-839-7074  
[www.manufacturingtodaywi.com](http://www.manufacturingtodaywi.com)

Please direct all inquiries to:  
[renee@teachingtodaywi.com](mailto:renee@teachingtodaywi.com)

*Manufacturing Today WI*™ is an independent publication for educators.

The opinions expressed in *Manufacturing Today WI*™ are not necessarily the opinions of *Manufacturing Today WI*™. We reserve the right to edit any and all materials submitted due to grammar, content and space allowances. Articles, photos and artwork submitted to *Manufacturing Today WI*™ are assumed to be released by the submitter for publication.



UNIVERSITY OF WISCONSIN  
**PLATTEVILLE**  
COLLABORATIVE ENGINEERING  
PROGRAM

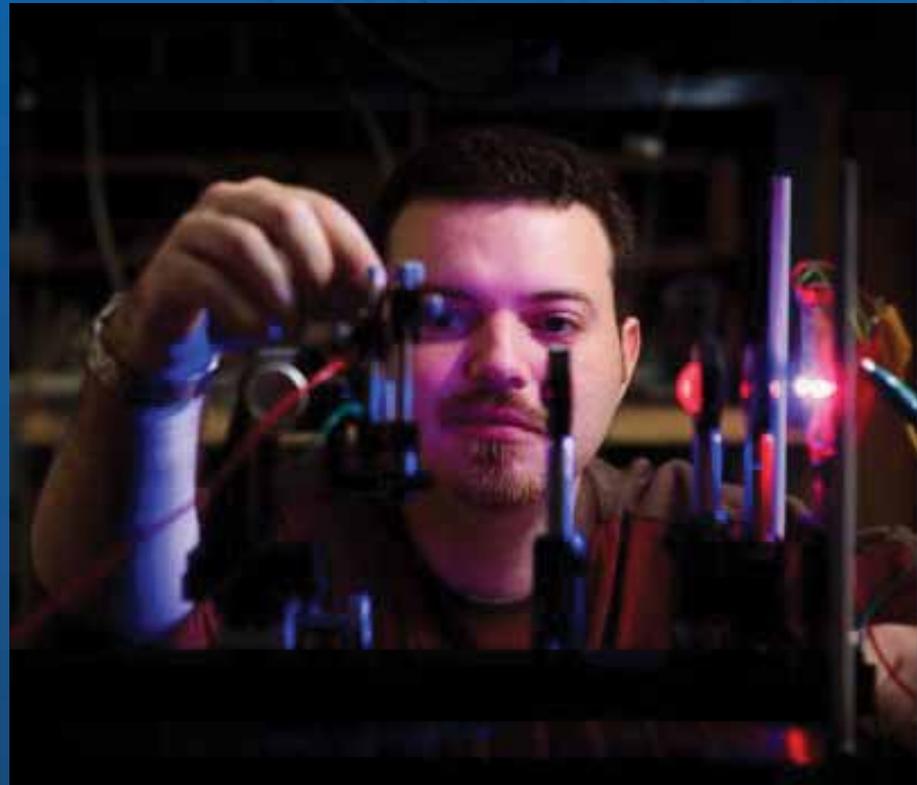
You can earn an engineering degree from  
**UW-PLATTEVILLE**



**WHEREVER YOU ARE**

**WHAT IS UW-PLATTEVILLE  
COLLABORATIVE ENGINEERING?**

UW-Platteville in partnership with UW Colleges provides the opportunity to pursue an ABET-accredited bachelor's degree in electrical or mechanical engineering from UW-Platteville.



**HOW DOES IT WORK?**

Students complete the associate degree requirements and pre-engineering courses at one of the 13 UW Colleges campuses or through UW Colleges Online.

While working towards an Associate of Arts or Science degree, students begin taking the UW-Platteville engineering courses by distance technology or in a face-to-face classroom depending on the student's location.

The UW-Platteville engineering courses offered through distance technology are recorded during live classes and then made available via UW-Platteville's online course management system, Desire2Learn.



## HOW IS UW-PLATTEVILLE ENGINEERING UNIQUE?

- Hands-on, lab-heavy experiences
- Theory-based curricula
- No teaching assistants—all courses are taught by engineering professors
- UW-Platteville graduates are prepared to perform engineering functions upon hire

UW-Platteville engineering courses are taught face to face on the following UW Colleges campuses:

- UW-Fox Valley
- UW-Rock County
- UW-Washington County



## WOULD YOU LIKE MORE INFORMATION?

Visit: [www.uwplatt.edu/Collaborative-Engineering](http://www.uwplatt.edu/Collaborative-Engineering)

E-mail: [CollaborativeEngr@uwplatt.edu](mailto:CollaborativeEngr@uwplatt.edu)

Call Leann Leahy : 608.342.6124



UNIVERSITY OF WISCONSIN

# Colleges

# GPS Education Partners Wins National Award As It Prepares For National Expansion

By Allison Jacobsmeier

The concept of apprenticeship in our state is nothing new. In fact, the first legislation in the United States to promote an organized system of apprenticeship was enacted in Wisconsin in 1911. Fast forward 104 years and one might ask, has the concept gone stale? With over 2 million US manufacturing jobs predicted to go unfilled in the next decade, there is cause for concern and an undeniable need for apprenticeship to be reintroduced to the next generation of the technical workforce as a viable and attractive pathway to career success. One Wisconsin youth apprenticeship program, GPS Education Partners, is on a mission to do just that both at home and beyond.

Since 2000, with continued support from founding partner nearly 400 students and hundreds of partners across the eastern half of the state have embraced the organization's innovative education model, one that uniquely prepares students for success in technical careers and promotes viability for business. Students journey along a pathway to master academic, technical, and character

development competencies while immersed in real manufacturing settings. Spending up to two years in the program, they complete necessary high school graduation requirements, earn nationally-respected industry certifications and stackable post-secondary credits, develop character and leadership skills, and experience first-hand many of the jobs available within the business of manufacturing. Of the over 115 manufacturers currently partnered with the nonprofit, 15 donate additionally the space needed for classroom instruction, allowing for the entire apprenticeship experience to take place within a manufacturing facility.

Students and partners alike have praised the many nuances of the GPS Education Partners model, including its emphasis on immersive applied learning, blended delivery structure, and a personalized learning approach. Rising GPS Education Partners senior, Andy, says, "GPS Education Partners has set me up for success in the real world. The hands-on aspect of the program has given me tools, such as the ability to read blueprints, that I will use in my future career



as a welder. I would highly recommend GPS Education Partners to other students who are looking to gain a variety of work experiences in the manufacturing industry and determine a future career path."

Mark Blodgett, Associate Principal of the program's first school district partner, Mukwonago High School, continues to find

**Continued on Page 21**

14<sup>TH</sup> BIENNIAL



WISCONSIN  
**MANUFACTURING  
& TECHNOLOGY**  
SHOW

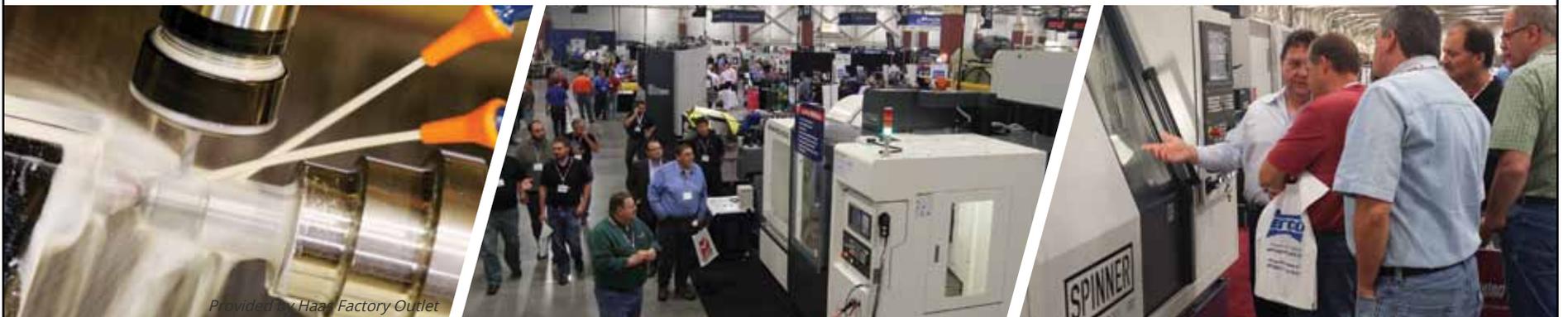
**OCTOBER 6-8, 2015**

Exposition Center at Wisconsin State Fair Park | Milwaukee, WI

**REGISTER TODAY!**

**FOR WISCONSIN'S LARGEST MANUFACTURING EVENT!**

**SAVE \$15 WHEN YOU REGISTER ONLINE! VISIT [WIMTS.com](http://WIMTS.com)**



Provided by Haas Factory Outlet

Catch up on the latest metalworking technology, see machines up and running, discover solutions to all your manufacturing challenges, and learn from **keynote speakers at technical seminars and Main Stage events**—at Wisconsin's leading Metalworking & Manufacturing Tool Show.

# Got Skills? Think Manufacturing

Bureau of Labor Statistics (BLS)

Future job openings are expected to result from the need to replace workers who are retiring. In addition, the pay is good: BLS data show that manufacturing workers often earn more overall than workers in other industries.

Some manufacturers are also moving production back to the United States as they factor in variables such as increasing labor costs abroad, the high cost of transporting goods, and the risks associated with foreign manufacturing. “Every week we’re hearing about a new company building a plant in the United States,” says Gardner Carrick of the Manufacturing Institute in Washington, D.C. “We’ve seen 4 straight years of job growth in manufacturing.”

“In what’s becoming a digital world, there’s still a demand for tangible goods,” says Brian Herrick of Baltimore, Maryland. “I like the tangible aspect of manufacturing. I like watching how things are made. You don’t get that in any other industry.”

Herrick should know. He has worked in several manufacturing industries and sees career potential for people who develop the right skills. “Manufacturing can be a great training ground, where you can learn how things are done and take things through production,” he says. “Once you develop that skill set, you gain competencies you can take anywhere.”

Industry experts say there’s a need for workers with the right skills in manufacturing. Employers are having trouble filling jobs for machinists and maintenance technicians, among other skilled trades. “We have manufacturers calling us weekly, wanting to hire our students,” says Dave Lynnes, president of a welding school in Fargo, North Dakota. Job openings are expected for welders and other production workers—but also for workers outside of production, such as biomedical engineers, dispatchers, and truck drivers.

**Qualities and skills.** Manufacturing workers need to be able to cooperate as part of a team. They also need to be detail oriented, dependable, and adept at problem solving. Dexterity and mechanical or technical ability are important, too.

A willingness to learn and to be flexible about job tasks is also important. “Manufacturers are looking for people who take an interest in learning computer operation, quality control, and how to operate computer-based machinery,” says Brian Sweeney of the Maryland Manufacturing Extension Partnership in Columbia, Maryland. “Jobs today are not always ‘I do this every day.’ A lot of workers are expected to do different things in the plant.”

**Credentials.** In some occupations, it may be important, or even necessary, to have state



licensure or certification from a professional association or credentialing body. For example, machinists who complete certification programs may have better job opportunities than those who don’t. And heavy and tractor-trailer truck drivers often need a commercial driver’s license before being hired.

**Education.** Manufacturing occupations are available for people at all education levels. There are many occupations in manufacturing that typically require a high school diploma or successful passage of a high school equivalency exam. Some occupations in manufacturing that typically require an associate’s degree include industrial engineering technicians, chemical technicians, and semiconductor processors. Bachelor’s degree-level occupations in manufacturing include those in management and engineering. Occupations in manufacturing

that typically require a doctoral or professional degree include medical scientists and computer and information research scientists.

**Networking.** Networking can help you to learn more about the specifics of what employers are looking for. It might even provide clues about which manufacturers are hiring. Building a network can start anywhere. If you don’t have personal contacts, consider going straight to the source of employment. “Try to go visit one of your local manufacturers,” says Carrick. “They are in every state, in almost every small town or city, and most are willing to show people what they do.”

[www.bls.gov](http://www.bls.gov)



Read the current issue online complete with live web links!  
Check out our website at:

[www.manufacturingtodaywi.com](http://www.manufacturingtodaywi.com)



**Success Stories**



**Manufacturing Careers**



**Upcoming Events**



**Electronic/Flip Book**



Watch for all of the live links in the electronic/flip book  
There’s more Manufacturing Today WI just a <CLICK> away.

## Additive Manufacturing/3D Printing

Three years ago, printing three-dimensional objects at home might have sounded like a thing out of *The Jetsons*. But in just a few short years, 3D printing has exploded — shifting from a niche technology to a game-changing innovation that is capturing the imagination of major manufacturers and hobbyists alike.

First invented in the 1980s by Chuck Hull, an engineer and physicist, 3D printing technology has come a long way. Also called additive manufacturing, 3D printing is the process of making an object by depositing material, one tiny layer at a time.

The basic idea behind additive manufacturing can be found in rock formations deep underground (dripping water deposits thin layers of minerals to form stalactites and stalagmites), but a more modern example is a common desktop printer. Just like an inkjet printer adds individual dots of ink to form an image, a 3D printer only adds material where it is needed based on a digital file.

With some 3D printing processes, about 98 percent of the raw material is used in the finished part. Not to mention, 3D printing enables manufacturers to create new shapes and lighter parts that use less raw material and require fewer manufacturing steps. In turn, that can translate into lower energy use for 3D printing — up to 50 percent less energy for certain processes com-

pared to conventional manufacturing processes.

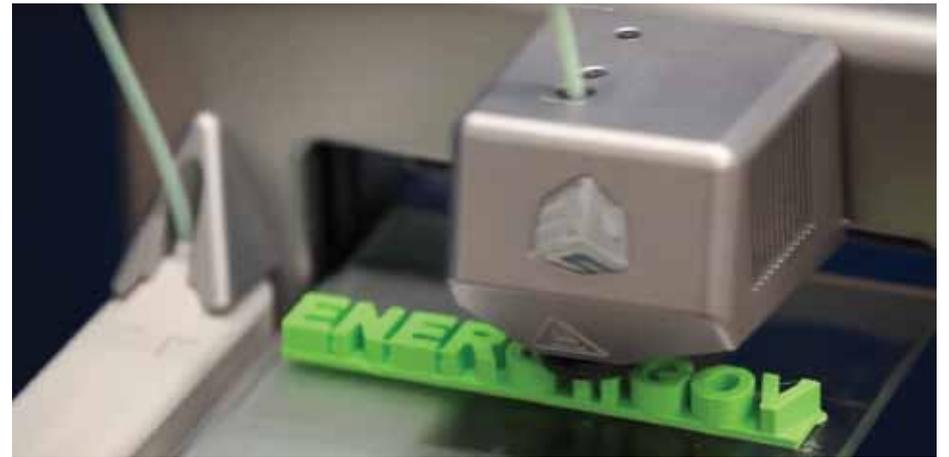
Though the possibilities for additive manufacturing are endless, today 3D printing is mostly used to build small, relatively costly components using plastics and metal powders. Yet, as the price of desktop 3D printers continues to drop, some innovators are experimenting with different materials like chocolate and other food items, wax, ceramics and biomaterial similar to human cells.

### How does a 3D printer work?

Additive manufacturing technology comes in many shapes and sizes, but no matter the type of 3D printer or material you are using, the 3D printing process follows the same basic steps.

It starts with creating a 3D blueprint using computer-aided design (commonly called CAD) software. Creators are only limited by their imaginations. For example, 3D printers have been used to manufacture everything from robots and prosthetic limbs to custom shoes and musical instruments. Oak Ridge National Lab is even partnering with a company to create the first 3D printed car using a large-scale 3D printer.

Once the 3D blueprint is created, the printer needs to be prepared. This includes refilling the raw materials (such as plastics, metal powders or binding solutions) and preparing the



build platform (in some instances, you might have to clean it or apply an adhesive to prevent movement and warping from the heat during the printing process).

Once you hit print, the machine takes over, automatically building the desired object. While printing processes vary depending on the type of 3D printing technology, material extrusion (which includes a number of different types of processes such as fused deposition modeling) is the most common process used in desktop 3D printers.

Material extrusion works like a glue gun. The printing material — typically a plastic filament — is heated until it liquefies and extruded through the print nozzle. Using information from the digital file — the design is split into

thin two-dimensional cross-sections so the printer knows exactly where to put material — the nozzle deposits the polymer in thin layers, often 0.1 millimeter thick. The polymer solidifies quickly, bonding to the layer below before the build platform lowers and the print head adds another layer. Depending on the size and complexity of the object, the entire process can take anywhere from minutes to days.

After the printing is finished, every object requires a bit of post-processing. This can range from unsticking the object from the build platform to removing support structures (temporary material printed to support overhangs on the object) to brushing off excess powders.

*Source: energy.gov/articles/how-3d-printers-work*

## WAUKESHA COUNTY TECHNICAL COLLEGE

### Hands-on skills for real-world careers

- Learn in a **state-of-the-art facility** from **experienced instructors**.
- Master **high-demand skills** that employers need.
- Start on a career path that **pays well**.

Check out our **Welding and Tool and Die (CNC)** programs **today!**

**WAUKESHA COUNTY TECHNICAL COLLEGE**

[www.wctc.edu/welding-tech](http://www.wctc.edu/welding-tech)  
[www.wctc.edu/tool-die](http://www.wctc.edu/tool-die)

Funded by Wisconsin Fast Forward – Blueprint for Prosperity:  
[www.WisconsinFastForward.com](http://www.WisconsinFastForward.com).

# Soon to be the Big 4-0, but Dynamic Tool & Design is getting younger and younger

Lori Phillips

*Dynamic Tool & Design, Inc.*

The apprentice program at Dynamic Tool & Design is a key part of our company organizational plan and has helped us achieve 40 years of continued growth. Dynamic employs 60 people and the average employee tenure is 14 years. With all of the great history and longevity, it is also worthwhile to note that Dynamic is getting younger and younger. Over the past four years we have tripled the number of employees under the age of 35. Apprentice programs are helping drive that growth.

Our tenured employees have a vast wealth of knowledge and the apprentice programs allow the opportunity to train our younger, tech-savvy employees. We currently have three employees enrolled in the State of Wisconsin apprentice program and four employees enrolled in our own internal apprentice program. Both programs require the apprentice to complete 10,400 hours of training over five years.

The apprentice program allows employees to be trained without having any prior knowledge or experience. Ben Clark, who has been an internal apprentice for a year and a half, worked at a trucking company prior to Dynamic. He is currently learning the inspection process and looks

forward to learning other areas of the shop. The apprentice program gives an employee the chance to build a solid career from the ground up. Keone Evans recently signed his contract to enter the Registered Apprentice program.

Dynamic works closely with the Wisconsin Youth Apprentice program and WCTC's Dual Enrollment Program. The Dual Enrollment program allows high school students to attend college classes and earn college credits while still in high school.

"Dynamic Tool & Design has supported the Registered Apprenticeship program for over 30 years and is proud to support the Youth Apprenticeship Program," said David Miller, President of Dynamic Tool & Design. "The company continually looks to local high schools and colleges for new talent. The Youth Apprentice/Registered Apprenticeship program is a win-win for Michael and Dynamic Tool and will help us maintain our industry leadership," Miller said.

Recent high school graduate, Michael Nareski is the first DEA graduate to apply the academy's curriculum and Youth Apprenticeship hours and competencies toward a Registered Apprenticeship as a Tool and Die Maker.

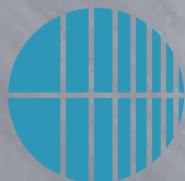


Nareski attended E-Achieve Academy – an independent virtual charter school administered through the School District of Waukesha – and through his concurrent DEA curriculum was able to complete six of the required courses for a Tool and Die Maker Apprenticeship, which is equivalent to 250 hours of the 576 hours of required

paid related instruction. Nareski was credited 350 of his 712 hours worked in his Youth Apprenticeship in Manufacturing and will complete his Registered Apprenticeship coursework at WCTC.

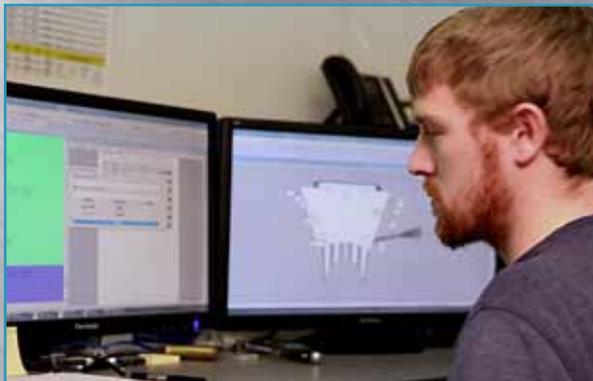
"This alone saves Dynamic Tool the

**Continued on Page 21**



## DYNAMIC

INNOVATIVE MOLD BUILDING



### Build your Career at Dynamic Tool & Design

At Dynamic Tool & Design, we hire high school and college students who have an interest in learning to design and machine plastic injection molds. We participate in the WI Registered Apprentice program and also have our own internal apprentice program.

Dynamic Tool designs and builds plastic injection molds for the packaging, personal care and medical markets.

We are a 60 strong, employee-owned company, and in 2016 we will celebrate 40 years of innovative mold building.

Dynamic Tool & Design, Inc.  
W133 N5180 Campbell Drive  
Menomonee Falls, WI 53051  
262.783.6340 • [molds@dyntool.com](mailto:molds@dyntool.com)

Apply online at [dyntool.com](http://dyntool.com)



# Cardinal Manufacturing Craig Cegielski wins National Rural Teacher of the Year Award



John Hill, Executive Director of the National Rural Education Association, announced the selection of Craig Cegielski as the Monsanto Fund National Rural Teacher of the Year.

Cegielski teaches at Eleva-Strum High School in Strum, Wisconsin, where he has taught grades 9-12 with various levels of

welding, machining, woodworking, automotive, CAD, and Cardinal Manufacturing for the last 10 years. He has a total of sixteen years of experience.

Cegielski shares, "when I started teaching I thought I should teach my students all the technical skills at the highest possible levels. Thanks to the guidance of so many great

people, I understand I need to teach students to be good people and good employees and the technical skills will follow."

Eleva-Strum principal, Cory King emphasizes Cegielski's "confidence and enthusiasm in his every day work" and his personal accountability when working with other teachers, support staff, administration, parents, and community leaders. Mary Summers, Eleva-Strum District Special Education teacher, says "Craig is a teacher that promotes a classroom in which all students can learn...even though Craig has been a teacher for many years, he still comes to work every day with the excitement of a first year teacher."

Cegielski's signature achievement is the development and implementation of Cardinal Manufacturing, a student-run manufacturing enterprise within the district. Students take a variety of classes in 9th and 10th grade, then apply for a position in Cardinal Manufacturing as 11th and 12th graders. There are real customers, real deadlines, real quality issues, and real money involved.

Jeff Rohrschieb reports, "My son was part of Cardinal Manufacturing for two years

... The experienced increased his self-confidence, his motivation to work, and taught him responsibility."

"If you take any of Mr. Cegielski's classes you are going to learn a lot about soft skills because he believes if you have them you can be taught anything," says former student Colin Nyseth.

District administrator, Craig Semington, sums him up this way, "Mr. Cegielski is the gold standard for tech-ed teachers and the best in class."

He will receive a \$2000 award and Eleva-Strum High School will receive \$1000. All finalists for the award will be recognized at the banquet to be held October 17 in St. Louis, MO.

Source: National Rural Education Association

cardinalmanufacturing.org  
www.esschools.k12.wi.us  
(715) 695-2696 x2032



# Can you see

all the possibilities advanced manufacturing has to offer?



**October** is Manufacturing Month, and the Manufacturing Outreach Center at University of Wisconsin-Stout is a proud partner in this effort to inspire the next generation of manufacturers. We invite all students, educators, counselors, advisors, parents, and those "just curious" to take a closer look at what Wisconsin manufacturing is really all about.

This fall, open your eyes to the possibilities....

**Interact** with industry experts at the 8th Annual Manufacturing Advantage Conference, November 4-5 at UW-Stout. Visit [www.uwstout.edu/profed/mfg](http://www.uwstout.edu/profed/mfg).

**Attend** Manufacturing Month tours and activities in your area. Find events at [www.mfgday.com](http://www.mfgday.com) and [www.wimanufacturingmonth.org](http://www.wimanufacturingmonth.org).

**Explore** advanced manufacturing career options and educational requirements at [www.goldcollarcareers.com](http://www.goldcollarcareers.com).

# Cardinal Manufacturing — A Company of National Notoriety



The scene Craig Cegielski took in the day he accepted the job as Tech Ed Teacher the shop at Eleva-Strum High School, looked to be in the same state that many school shops struggle in. Underequipped and out of date, the shop needed to catch up with the times. The machinery that was there needed a tune-up. Some pieces needed cleaning; others, replacing, and many pieces weren't even there. The lighting was poor, heating was questionable, and air conditioning was unheard of.

It was humbling, to say the least. But Cegielski had a mission. He'd come to plant an idea in this place, and with dedication, effort, and a love of getting his hands dirty, he would spur this program to new heights.

Cardinal Manufacturing began in the Eleva-Strum School District during the 2007-2008 academic year when Craig approached the School Board about the potential of pursuing an in-school manufacturing business similar to one he started in his prior position

in the school district of Antigo, WI. The school board approved.

He spent many extra hours bent over a worktable late in the night to meet deadlines. At other times, he was out in the community building partnerships with the local businesses.

Cardinal Manufacturing, a student-run business, has gone from its infant stages to a company with significant annual sales and national notoriety. The growth of the program has attracted national and international attention and Cardinal Manufacturing has attended national tradeshows and hosted celebrity guests. The program has become an epitome of what can happen in any school shop, with the right blend of work and ingenuity.

Many people have applauded Cegielski for his turnaround of the Tech Ed program. He tells them all, it's not him that deserves the pat on the back. "The list of people who have helped make Cardinal Manufacturing doesn't end. I've got a binder in my office stuffed full with different business cards from all the businesses that have helped us to where we are now. People think I'm some genius; I feel more like a traffic director."

Cardinal Manufacturing has served hundreds of customers from private individuals

to clients throughout the state of Wisconsin and other parts of the country. The students perform everything from a simple repair job to custom designed and machined parts, Cardinal Manufacturing meets a wide variety of needs.

A number of students have gone directly to skilled employment positions after high school, but most choose to go on to post-secondary education through technical college or the university system. "Students in Cardinal Manufacturing are the cream of the crop," Cegielski states. "We only take the best. People wanting to get in need to go through an interview process, just like at a real business, and our admittance is limited."

This rigorous admission procedure may seem like a chore to some, but one student sees them much like the Pearly Gates. "It's like judgment time, to see whether you make the cut. Do you get in or don't you? I mean, once you make it, it's like any shop student's dream. To work during school . . . for a paycheck." It's true. Students do get a part of the profit. After all the figures have been totaled,

**Continued on Page 21**



**Together.**

**We can build the future.**

Come join us in our vision of quality, service, and innovation in all that we do—from custom precision manufacturing to inventive engineering. Continue developing your skills and talents right here among experts in our industry who utilize advanced equipment techniques every day. Make your next career move a great one, and be a part of our innovative team.

- Benefits for full-time employees
- Competitive pay
- Advanced training opportunities
- Team work environment

**RIVERSIDE**  
MACHINE & ENGINEERING  
1.800.483.5817  
[www.riversidemachine.com](http://www.riversidemachine.com)  
Visit us online to learn more.

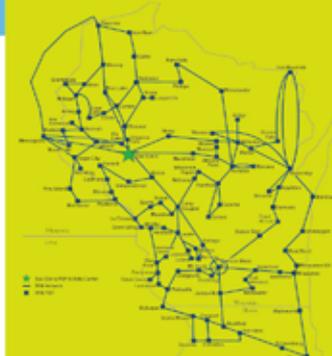


**TRI-COUNTY**  
**TCC** 1.800.831.0610  
COMMUNICATIONS COOPERATIVE, INC. [WWW.TCCPRO.NET](http://WWW.TCCPRO.NET)

**STATEWIDE FIBER NETWORK**  
**GIGABIT SERVICES**  
**MULTI-OFFICE CONNECTIVITY**  
**BUSINESS SERVICES**  
**REDUNDANT NETWORK**



**FIBER NETWORK MAP**



# GRANTS & COMPETITIONS

## American Honda Foundation Education Grants

The American Honda Foundation supports education with a specific focus on the areas of science, technology, engineering, and mathematics (STEM); the environment; job training; and literacy. Awards range from \$20,000 to \$75,000 over a one-year period.

**Deadline:** Applications are due May 1, August 1, November 1, and February 1.

**Website:** [corporate.honda.com/america/philanthropy.aspx?id=ahf](http://corporate.honda.com/america/philanthropy.aspx?id=ahf)

## Saxena Family Foundation Grants

The Saxena Family Foundation, Inc. has a particular focus on initiatives that promote

US science, technology, engineering, and mathematics (STEM) education and the empowerment of girls, female children, and young women.

Most awards range from \$5,000 to \$50,000.

**Deadline:** Applications are accepted year-round, and are reviewed by the selection committee as they are received.

**Website:** [www.saxenafoundation.com/guidelines.html](http://www.saxenafoundation.com/guidelines.html)

## Siemens PLM Software Grant

The SME Education Foundation's mission is to prepare future engineers and technologists for advanced manufacturing careers through outreach programs to enrich students

to study science, technology, engineering, and mathematics (STEM) in alignment with SME.

**Deadline:** Applications are accepted year-round.

**Website:** [www.smeef.org/what\\_we\\_do/page/siemens](http://www.smeef.org/what_we_do/page/siemens)

## ACS Award for Encouraging Disadvantaged Students into Careers in the Chemical Sciences

The purpose of the ACS Award is to recognize significant accomplishments by individuals in the United States who encourage disadvantaged students to choose careers in chemical sciences and engineering.

Grants of \$5,000 each are awarded, plus up to \$1,500 in travel expenses to the meeting where the award will be presented. In addition, grants of \$10,000 are awarded to an institution chosen by the recipient.

**Deadline:** Nominations are due November 1, annually

**Website:** [www.acs.org/content/acs/en/funding-and-awards/awards/national/bytopic/acs-award-for-encouraging-disadvantaged-students-into-careers-in-the-chemical-sciences.html](http://www.acs.org/content/acs/en/funding-and-awards/awards/national/bytopic/acs-award-for-encouraging-disadvantaged-students-into-careers-in-the-chemical-sciences.html)

## Siemens Competition in Math, Science & Technology

The Siemens Competition seeks to promote excellence by encouraging students to undertake individual or team research projects. It fosters intensive research that improves students' understanding of the value of scientific study and informs their consideration of future careers in these disciplines.

Scholarships for winning projects range from \$1,000 to \$100,000. National finalists receive an expense-paid trip, with a chaperone, to Washington, D.C.

**Deadline:** All competition materials are due September 22, 2015 at 11:59 p.m. (EST).

Individuals or teams entering a research project in the competition must register online prior to the deadline date.

**Website:** [siemenscompetition.discoveryeducation.com/](http://siemenscompetition.discoveryeducation.com/)

## eCYBERMISSION

eCYBERMISSION is a web-based science, technology, engineering, and mathematics (STEM) competition free for students in grades 6 through 9 where teams can compete for state, regional, and national awards while working to solve problems in their communities.

**Deadline:** A Team Advisor must register and join the team by the end of registration – December 16, 2015!

**Website:** [www.ecybermission.com/HowToCompete](http://www.ecybermission.com/HowToCompete)

## Middle School National Science Bowl

The US Department of Energy (DOE) National Science Bowl (NSB) is a nationwide academic competition for middle and high school students that tests knowledge in all areas of science and mathematics. It was created in 1991 to encourage students to excel in mathematics and science and to pursue careers in those fields.

**Deadline:** Regional competition dates vary.

See the website for specific dates. The national competition will take place April 28 through May 2, 2016 and again April 27 through May 1, 2017.

**Website:** [science.energy.gov/wdts/nsb/](http://science.energy.gov/wdts/nsb/)

## Team America Rocketry Challenge

The Team America Rocketry Challenge (TARC) strives to inspire the next generation of engineers and technicians to join the aerospace industry.

Prizes up to \$100,000 are awarded.

**Deadline:** Entries are accepted September 1 through December 4, 2015.

**Website:** [rocketcontest.org/](http://rocketcontest.org/)

# Northwoods Manufacturing

Continued from Page 7



and eventually down the line it will help the industry that is helping the schools.”

Northwoods Manufacturing's students showed off their skills at the Second Annual Northwoods Manufacturing Open House on March 15th.

“All the kids down there, about 40 or so, are doing live demonstrations on all the manual equipment,” said Hostettler. “We also have some of the stuff we've made throughout the year on display.”

“It's a lot of fun,” said one Hurley senior. “It's easy work if you put your mind to it. There's plenty of opportunity for jobs out there. They're looking for people constantly. It's a fun field to get into.”

“This type of program really encourages good work ethic,” said Hostettler. “So by

doing this and having deadlines and having them keep track of time and giving them more and more responsibility at a young age gets them a little better prepared for the future.”

*Sources: Wisconsin School News April 2015/Shelby Anderson Editor and Northwoods Manufacturing*

[www.hurley.k12.wi.us  
northwoodsmfg.org](http://www.hurley.k12.wi.us/northwoodsmfg.org)  
(715) 561-4900 x314 or x219

# Dynamic Tool & Design Getting Younger and Younger

Continued from Page 17

cost of Mike's wage for those 250 hours, the cost for the Apprenticeship class tuition, helps create a succession plan for Dynamic Tool, and also frees up more time for Mike to work toward his 9,824 hours of on-the-job learning," said WCTC Dean of Applied Technologies Mike Shiels.

DEA, which began as a pilot program in fall of 2013, allows high school seniors to earn technical college credits while they develop in-demand skills to enter the workforce. Currently, program options include Tool and Die/CNC, Welding/Metal Fabrication, Printing and Publishing and Baking and Pastry Production. The program is a collaboration between WCTC, eight local industries and thirteen high schools. Ninety-five percent of this year's DEA trainees graduated from the program, and 83 percent of the graduates gained employment upon graduation.

## About Youth Apprenticeship to Registered Apprenticeship

Authorized by state statute since 1991, Wisconsin's Youth Apprenticeship (YA) program is a nationally recognized work-based learning model operated by the Department of Workforce Development (DWD) and regional consortium partners to help high school students gain academic and technical college-level instruction in a hands-on learning environment with mentored on-the-job training in an occupational area of interest over one or two years. Students who complete the program graduate on track, earn a YA completion certificate, and may receive technical college credit and industry credentials. YA provides youth with the skills needed for postsecondary education and employment success, including Wisconsin Registered Apprenticeship (RA) program opportunities with employer

commitments to hire and train certified skilled workers through related classroom instruction and work-based learning under the supervision of experienced journey workers. Find more information about YA and RA at these websites:

**Website:** [www.dwd.wisconsin.gov/youth/apprenticeship](http://www.dwd.wisconsin.gov/youth/apprenticeship)

**Website:** [www.dwd.wisconsin.gov/apprenticeship](http://www.dwd.wisconsin.gov/apprenticeship)

## About Waukesha County Technical College

Waukesha County Technical College, the leader in workforce development, prepares learners for success within the region and global economy. The college serves nearly 24,000 students annually and offers areas of study including associate degree, technical diploma, apprenticeship and short-term certificate programs. Customized

training is also available for employers. To learn more, visit the site below.

**Website:** [www.wctc.edu](http://www.wctc.edu).

## About Dynamic Tool & Design, Inc.

Dynamic Tool & Design Inc. is a global, plastic injection mold manufacturer located in Menomonee Falls, Wisconsin. In business for 39 years, Dynamic Tool & Design, Inc. is a technological leader within the industry. Dynamic Tool & Design is an employee-owned company. Visit the site below.

**Website:** [www.dyntool.com](http://www.dyntool.com).

# Cardinal Manufacturing

Continued from Page 19



staying after to get it finished, and in the end they'll have to look that customer in the eye whether they finished his work order or not."

In-school programs such as Cardinal Manufacturing serve as a grassroots economic development effort. Not only do these programs expose students to career opportunities in manufacturing and teach students soft skills for future employment, but they also work toward changing the attitudes of counselors and parents to be more open to the idea of encouraging students to look at manufacturing careers. Students get hands on opportunities to try out these roles before making an expensive decision in choosing a post-secondary program. In other words, kids get the chance to try welding, machining, construction, production management, accounting, office management, and marketing prior to committing to a major or area of study. The services provided through the program are worthwhile and valuable to the customers who pay for the service. Since the very beginning, Cardinal Manufacturing has been self-sufficient meaning that they have not ever requested a special budget from the school district.

the shop expenses cut out, and reserve money set aside, the rest goes to the students. Cegielski's payment system is based not only on total hours, but also performance reviews. That means if a student has kept his tardy and sick days to a minimum, they might just find a bonus in their paycheck.

It's clear why only the best get into this prestigious program. Responsibility is key. "(These projects) are not just something they're turning in for a grade." Cegielski explains. "They've got the paycheck to work for. If they mess it up, they're the ones in the truck going for more material, they're the ones

[cardinalmanufacturing.org](http://cardinalmanufacturing.org)  
[www.esschools.k12.wi.us](http://www.esschools.k12.wi.us)  
 (715) 695-2696 x2032



# GPS Education Partners

Continued from Page 14

value in the model for his students 15 years later. "The Mukwonago School District has had a long commitment to linking our schools, businesses, and the community to develop a system that will better prepare all graduates for their future place in society.

The impact of this unique education model, whereby immersive learning provides students the opportunity to learn and apply newly acquired skills in real-time, is also being recognized outside the state. Earlier this year, the Manufacturing Standard Skills Council (MSSC) awarded GPS Education Partners the prestigious Authorized Center Award at its annual Leadership Conference in Indianapolis, Indiana. MSSC is an industry-led, training, assessment and certification system focused on the core skills and knowledge needed by the nation's frontline production and material handling workers. Through a partnerships, GPS Education Partners is able to provide high school juniors and seniors the opportunity to earn those nationally recognized certifications.

Winning national awards certainly fuels conversation about GPS Education Partners' success highlighting the demand for this kind of apprenticeship, but, GPS Education Partners President Stephanie Borowski says it's the transformation of students that is truly the most fulfilling. "GPS Education Partners boasts a 92% graduation rate. Approximately 70% of this year's graduating class accepted employment prior to graduation and over 20% have enrolled

full-time in post-secondary education. That is navigating student success! Our students display initiative and perseverance every day. With the support of our dedicated partners, parents, and instructors, they successfully traverse each challenge brought before them, demonstrating character and leadership that takes them far beyond our program. Together, we are closing the skills gap. Together, we are transforming lives!"

It seems fitting that an apprenticeship program based in Wisconsin, a state steeped in such a rich apprenticeship tradition, is focused on advancing apprenticeship nationwide. And it seems the nation is ready! After months of increased demand from both the manufacturing and education industries, GPS Education Partners is now in discussion to expand its model to other states across the Midwest beginning in early 2016. GPS Education Partners will engage technical colleges, school districts, manufacturers, and other community influencers with its education model in an effort to accelerate technical education and promote success in technical careers.

[gpsed.org](http://gpsed.org)  
 (262) 226-2001



# CAREER CENTER

## What would you like to do in Manufacturing?

- Accountants
- Administrative Managers
- Advertising Sales Agents
- Aerospace Engineers
- Agricultural and Food Science Technicians
- Agricultural Engineers
- Aircraft Structure, Surfaces, Rigging, and Systems Assemblers



- Architectural and Engineering Managers
- Automotive Engineers
- Biofuels Processing Technicians
- Biological Engineers
- Biological Technicians
- Bookkeepers
- Career and Technical Education Teachers
- Cargo and Freight Agents
- Chemical Engineers
- Chemical Equipment Operators and Tenders
- Chemical Plant and System Operators



- Civil Engineering Technicians
- Computer Network Architects



- Computer Programmers
- Computer User Support Specialists
- Database Administrators
- Electrical and Electronic Engineering Technicians
- Electrical Engineering Technicians
- Electrical Engineers



- Engine and Other Machine Assemblers
- Environmental Science and Protection Engineers
- Environmental Science and Protection Technicians, Including Health
- Financial Quantitative Analysts
- Forest and Conservation Technicians
- Industrial Engineers
- Industrial Engineering Technicians
- Industrial Machinery Mechanics
- Industrial Safety and Health Engineers
- Information Technology Project Managers

- Installation, Maintenance, and Repair Workers
- Hydroelectric Plant Technicians
- Logistics Analysts
- Logisticians
- Machinists
- Mapping Technicians
- Mechanical Engineering Technicians
- Mechanical Engineers
- Medical and Clinical Laboratory Technologists



- Medical Equipment Repairers
- Medical Scientists
- Millwrights
- Nanosystems Engineers
- Nuclear Engineers
- Nuclear Equipment Operation Technicians



- Nuclear Power Reactor Operators
- Occupational Health and Safety Specialists

- Outdoor Power Equipment and Other Small Engine Mechanics
- Paper Goods Machine Setters, Operators, and Tenders
- Precision Instrument and Equipment Repairers
- Purchasing Agents
- Robotics Engineers



- Robotics Technicians
- Sales Managers
- Sales Representatives
- Sawing Machine Setters, Operators, and Tenders, Wood
- Semiconductor Processors
- Shipping, Receiving, and Traffic Clerks
- Software Developers, Applications
- Soil and Water Conservationists
- Statisticians
- Telecommunications Line Installers and Repairers
- Textile Cutting Machine Setters, Operators, and Tenders
- Tool and Die Makers
- Transportation, Storage, and Distribution Managers
- Water/Wastewater Engineers
- Welders, Cutters, Solderers, and Brazers

*Please note: This represents a broad and not conclusive list of careers within the world of manufacturing.*

Explore Manufacturing Careers at

[www.manufacturingtodaywi.com](http://www.manufacturingtodaywi.com)

**BUILDING A CAREER  
REQUIRES AN IDEA...**

[www.dreamitdoitwi.com](http://www.dreamitdoitwi.com)



### **A PLAN**

*Manufacturers in our area offer a range of opportunities that allow you to use your talents and build a career you can be proud of!*



### **KNOWLEDGE**

*Learn more about and enroll in manufacturing-related programs at one of our area's excellent technical colleges!*



### **AND DESIRE**

*Now more than ever, there is a surging demand for knowledgeable, talented, and driven people!*



