Workforce Development
Can Nontraditional Opportunities Turn the Tide?

INSIDE THIS ISSUE:

14 INDUSTRY SPOTLIGHT
Upskilling - Colleges Team Up to Deliver Customized Training

18 INDUSTRY PROFILE
Minnesota PIPELINE Program
A Dual-Training Approach to Building Skilled Workers

22 CASE STUDY
Sodick Inc.
Linear High-Speed Mill Gives Flexibility to Diamond Tool
We love to exceed your expectations.

Productivity machine tool purchases come with service, training and applications support. And, as a single-source machine tool supplier, you have access to all our products and services to help you succeed. You can count on Productivity to always deliver more than expected.

Let us exceed your expectations today!

MINNESOTA
763.476.8600

IOWA
319.734.3403

NEBRASKA
402.330.2323

PRODUCTIVITY.COM

Machine Tools | Tooling & Accessories | Robotics & Automation | Service | Applications Engineering | Preventive Maintenance
Rotary & Live Tool Repair | Integrated Supply | Machine Moving | Used Machines | Training
Workforce of the Future
We Must Set Up Expectations for Success
by Jesse Schelitzche

The term “workforce” is not new to anyone paying attention. We continually hear about worker shortages, low talent pools, fierce competition for strong employees, and challenges to retain great talent. This edition focuses on some unconventional approaches to what has been known as “workforce development.” That is, what are some companies doing that goes against the industry norms we’ve become accustomed to?

When we think of the factory floor of the future, many go directly to less humans, more robots. But before we automate every aspect our shop, let’s all agree that employees will be an integral part of our companies. Will this look different than it does today? Absolutely. Does it mean the end of the skilled trades as we know it? Not even close.

In regard to the employees we will hire, lead, and develop, I think it’s important that they know what we expect. The late David Ogilvy, who was chief executive officer of the advertising company, Ogilvy & Mather, discussed this at one of the company’s annual year-end parties. Speaking particularly to newcomers in the business, he said, “I want the newcomers to know what kind of behavior we admire and what kind of behavior we deplore.” Four of his 11 points included:

- First, we admire people who work hard. We dislike passengers who don’t pull their weight in the boat.
- We admire the great professionals, the craftsmen who do their jobs with superlative excellence. We notice that these people always respect the professional expertise of their colleagues in other departments.
- We admire people who build up and develop their subordinates, because this is the only way we can promote from within the ranks. We detest having to go outside to fill important jobs, and I look forward to the day when that will never be necessary.
- We admire well-organized people who keep their spaces shipshape, and deliver their work on time.

Setting expectations for our current and future workforce sets everyone up for success. Hiring and developing for the future must be the goal of every manufacturing business. Anything less will become accustomed to.

Of course, we must remember that the future is not written in stone. The business environment of the future is a moving target, as it always has been. As we look at training the next crop of talent, I believe a mix of historical expectations – strong work ethic, punctuality, respect, and integrity – can be combined with new philosophies and technologies – virtual learning, remote workspaces, and workplace connectivity. This combination will not only improve your workforce, it will set you up for success in the years to come.
I have to say that my job has become really fun when long-term strategies, day-to-day activities, and interaction with members all align! In this edition of the magazine, we’re talking about unconventional workforce development ideas, and as I’ll show in a moment, that is exactly what we’re working on with our Strategic Plan.

I’ve had some awesome discussions and visits with people like Deon Clark with the Legacy Academy, Diane Halvorson from the Workforce Council in Mankato, Mike Hreha of MINNCOR Industries, Kent Hanson of Anoka Technical College, and several others, including many of you. These organizations, as well as many companies like Pequot Tool, Jones Metal, and others, are getting very creative about not only finding people, but also finding resourceful ways to advance their skills and find ways to pay for it!

The third Pillar of our Strategic Plan is all about helping you find ways to take advantage of programs, apprenticeships, training, and financial resources that you might not otherwise know about or have the resources to pursue. The goal is to turn the tide and help your employees develop the skills that perhaps once took 15 years, but now can be completed quicker. I hope you gather a few new ideas from this edition of the magazine, and I hope you take advantage of what MPMA has to offer!

Another priority of mine has been to connect with other manufacturing associations around the state and coordinate our efforts. In order to accomplish this, we are working on planning a state-wide, two-day manufacturing conference this October. We are very excited about this event and we’ll share more information very soon!

STRATEGIC PLAN UPDATES

Pillar One: Government Relations/Advocacy. Director of Government Relations Amy Walstien is leading up our continued efforts at the State Capitol. With a new session led by a much different group of political leaders, Amy has had to engage and develop new relationships with many different individuals. MPMA’s goals this session revolve around next steps for the Youth Skills Training (YST) program to expand capacity and limit restrictions, strengthening dual-training options, and improving flexibility to fund schools and programs.

Pillar Two: Career Pathways. In an effort to narrow our focus in this area and gain results, our committee has decided to primarily focus on improving manufacturing’s image with parents. We believe that has a trickle-down effect on children, as well as school boards. We still need a couple more committee members and would love to find a few employees from your shop floors. The next steps are to determine events and outreach to connect to parents.

Pillar Three: Incumbent Training. Our committee has kicked off pilot visits with three MPMA companies to help determine the process to support them with grant and apprenticeship initiatives. We are also pursuing grant dollars from the Minnesota Department of Labor and Industry (DLI), Minnesota Job Skills Partnership, and potentially a partnership with the city of Minneapolis. And, we are considering an Academy concept that could be combined with more traditional on-the-job apprenticeship training, technical college education, possibly Titans of CNC. Academy, and of course PIPELINE or other funding. We plan to discuss these plans in depth at a future MPMA member program. More info to follow.

Things are moving! We are getting creative and taking action on a number of fronts. I look forward to sharing more with you soon, so you and your company can start taking advantage of these new offerings.

STEVE KALINA
Executive Director
Minnesota Precision Manufacturing Association
steve@mpma.com

"The third Pillar of our Strategic Plan is all about helping you find ways to take advantage of programs, apprenticeships, training, and financial resources."
**Workforce Development**

**Can Nontraditional Opportunities Turn the Tide?**

by Nancy Huddleston

For many manufacturers, workforce development is like a tidal wave that continuously churns over their heads. The programs designed to help find and train qualified workers drown them with details. Politicians rush in with well-intentioned promises about filling the skills gap, but the life preserver they offer often floats away on a sea of red tape.

Yet, manufacturers are resilient and are adept at finding ways to meet customer demands, while also growing their businesses. Many have discovered opportunities in nontraditional places to fit their needs, and to turn the tide about careers in manufacturing. Here are some examples.

**A FRESH PERSPECTIVE WITH FIRST ROBOTICS**

Could sponsoring a high school robotics team be an opportunity to cultivate future manufacturing workers?

Yes, according to Eric Andersen, President of Continental Engineering and Manufacturing (CEM) in Chaska.

“We’re exposing high school students to manufacturing and they are getting a first-hand view through FIRST Robotics,” he said.

“First Robotics is a great opportunity to help students to understand what manufacturing is all about,” Andersen said.

Sandy Olson, Lead Mentor of Talon Robotics, believes robotics and manufacturing are a natural fit that produces a win-win for sponsors and students. “Eric is so good and when our students come to him, he gives them lots of options for their designs and different approaches to find solutions,” she said.

“He also connects them with other companies that donate their time and space to help our students,” Olson said.

Joe Wenc, Business Mentor for Talon Robotics, said CEM’s sponsorship has immediate and long-term impacts on the team. “They machine parts for us, and when kids submit CAD drawings, their engineering staff sits with them to discuss their ideas and offer guidance,” he said.

Over the years, CEM also has donated equipment and materials. “They are passing along their knowledge, skills, and advice,” he said, “They love seeing the students learning what it takes to design a part, create a solid model, see how a part is programmed for CNC machines, watch their part being machined, learn how to TIG weld aluminum and MIG weld steel, and then put their final robot assembly together and compete on a local, and potentially world-wide stage.”

And “the program is coming full circle,” Andersen said, as he proudly reports that he is hiring alumni of the program after they have completed high school, vocational school, and/or college.

For more information: Go to MN FIRST Robotics’ website at www.mmfirst.org or go to Talon Robotics website: www.team2502.com, or contact your local high school guidance office.

**THE SKILLS GAP IS A LIE?**

Is the skills gap a lie? That’s an uncomfortable statement, but take a moment to get familiar with Titan Gilroy’s train of thought.

“If you talk about something for so long, it’s going to get glossed over, it’s going to get watered down, and it’s going to become a part of our normal lives,” said Gilroy, the founder of TITANS of CNC. Academy, who was the keynote speaker at MPMA’s ManufacturingNEXT event. “And I believe that is what’s happening with the skills gap. If you want to get real, we have a training gap, we have an awareness gap. We have serious problems in manufacturing that are easily fixed if we fulfill our words and follow through with action.”

According to Gilroy, the workers are already there – at entry level jobs in fast food and retail. But those are not sustainable careers because workers can’t earn enough money long term to support a family, buy a house, and purchase a car.

“The skills gap is gone – it’s a training gap and we have to have action,” he states. “That’s one of the reasons Gilroy started his “TITANS of CNC” television series – to give people a look at what manufacturing is all about. His Vlogs and programs on his TITANS of CNC YouTube channel have picked up where the show left off. Now, the TITANS of CNC Academy is offering a solution to the training gap. “We need a national standard for things such as multi axis, five axis, and horizontal milling,” Gilroy points out.

“There are no standards – they are just like they were 15 – 30 years ago. So we’re holding our kids, who are way more intelligent than us – in a box,” he said, “They can see, online, that other people can make these products, and they can do this and do that, but...”

[continued on page 10]
they’re falling out. We have to change the entire conversation.”

Listen closely to Gilroy’s Vlogs and you’ll discover he’s not anti-education. He often refers to educators as heroes, and when he does, he also points out that they do not have the tools or curriculum to help their students be successful. To that end, he said his Academy, which offers a new platform for manufacturing education “gives teachers, programmers, and shop owners the tools to be successful,” he said.

At Yeager Machine Inc. in Norwood Young America, they are using the Academy’s tools. Five employees are enrolled in the TITANS of CNC Academy. Owner Mike Yeager said they each have different skill levels, from an experienced machinist who is upgrading his skills, to a student who has completed a year of technical school curriculum.

Yeager is a seasoned machinist and shop owner who has experience using a variety of workforce development programs for the last 15 - 20 years. He was searching for something to fill the training gap for his new hires when he found Gilroy’s television show. At first, he was lukewarm to the shows, but “somewhere into the second season, it changed, and I got really interested in the message,” Yeager recalled.

Then Yeager met Gilroy at a conference. “It was a happenstance meeting, which led to other conversations with him,” Yeager explained. “I learned we had a lot in common – we both had the same-sized shops and the same concerns about hiring skilled people.”

When Gilroy launched his Academy, Yeager tried it firsthand. “I took the courses and did the things they taught on my own – not because I wanted to regain the skills I was not using anymore – but because I wanted to know if it was legitimate,” he said. “I did it nights and on weekends and I found it to be very easy, although it had been 10 years since I’d programmed a machine to run a part.”

Yeager then took his interest a step further by showing the program to his dad, co-workers, and other manufacturers his age. “I started talking about this seriously and began thinking – does this have the potential to replace a two-year technical degree?” he asked. “Yes it does – if you follow all of his programs and watch his Vlogs. And it’s not just about machining – it’s about being a good employee, being motivated to work in manufacturing, and as Titan says, ‘Rising to Greatness.’”

But before he made a commitment, Yeager had more questions. Along came another opportunity at a tech day at a machine tool builder in California. Gilroy was there, and Yeager approached him – not sure if he’d remember their past conversations. “I asked if he remembered me and he did – he said yes. ‘Minnesota Mike’ Yeager recalled.

They talked again – this time about the Academy. “I asked straight out – ‘what do you get out of the Academy?’” Yeager recalled, “He told me that’s a common question and that half the cost comes out of his pocket and the other half comes from his corporate partners.

That told me right there that what he says in his videos is true – that he is trying to give back to an industry that saved his life.”

Yeager is quick to make sure people know his experience is his own – and although he’d like to stand up on a soapbox and tell people to enroll their employees in the Academy – they have to evaluate it and make their own decisions. “The Academy curriculum is free – but there is a cost for tooling and materials, which Yeager Machine is paying for its employees. In turn, those five employees are investing their time and they must have a computer in order to learn the online curriculum – which is outside of your regular work hours.

For more information: Go to Titans of CNC Academy at www.titansofcnc.com and see more videos at www.youtube.com/titansofcnc.
JUNIOR ACHIEVEMENT
Some people remember Junior Achievement from their high school years. The original goal was “to help educate young people about production and free enterprise.”

Today, Junior Achievement’s purpose is to prepare young people to succeed in a global economy. Junior Achievement of the Upper Midwest is located in Saint Paul, and opened a new facility in January. It has classroom programs that educate students in grades K-12 about financial literacy, college and career readiness, and entrepreneurship. Other programs include JA BizTown, JA Finance Park, JA Titan, JA Job Shadow, and JA Company Program.

The Manufacturing Center is one of the JA BizTown businesses and it allows students to explore the manufacturing industry of vehicle design and creation with Polaris. Students use specially-designed software to create vehicles for business and retail use, and they determine ways to promote and sell their products.

For more information: Go to Junior Achievement of the Upper Midwest’s website: www.jaum.org, or call 651-255-0055.

MAKER MOVEMENT
“Makers” have been called the next generation of do-it-yourselfers. The movement often refers to artists and artisans, but it is also a broad term applied to “ tinklers” – those who learn by doing or are inspired to create something different. At the core, these folks are manufacturers, albeit on a micro scale. One example is the Nordeast Makers. There’s others too - the Hack Factory, Twin Cities Makers, MPLS Make, and one that is geared toward a younger crowd at the Children’s Museum. Each one is community of makers who share and help each other.

For more information: Check out the Maker Movement article on page 20.

A retention specialist is available to work with the employer and employee to offer assistance and support.

COVER STORY
JUNIOR ACHIEVEMENT
For job openings - at no cost, no strings, and no obligations to the employer with:
• Pre-Screening Services: EMPLOY staff pre-screen each candidate, review portfolios and aid in the paperwork.
• References & Verification: EMPLOY provides employment verification for each candidate.
• Employee Job Retention Assistance: A retention specialist works with candidates for up to one year following release.
• Employer Assistance: Employers are encouraged to contact EMPLOY anytime regarding an EMPLOY candidate.
• A retention specialist is available to work with the employer and employee to offer assistance and support.

For more information: Call: (651) 961-7512 or Email: employminncor@state.mn.us.

A retention specialist is available to work with the employer and employee to offer assistance and support.

For more information: Call: (651) 961-7512 or Email: employminncor@state.mn.us.

LUBE-TECH
CNC SUMP CLEANING
Let Lube-Tech Take Care Of The Dirty Work For You
Learn more at lubetech.com
The Lube-Tech Certified Clean sump cleaning service ensures:
• Machines are cleaned using a standard process
• Coolant is mixed properly
• Bacteria is controlled

Performance proven in a wide range of industries:
• Electronics
• Automotive
• Aeronautic
• Medical
• Recreational
• Consumer Products

Trusted Manufacturing Solutions Provider:
• Contract Machining
• Production Stamping
• Dies
• Molds
• Special Machines
• Jigs
• Fixtures
• Waterjet Cutting

MRG Tool and Die
1100 Cannon Circle, Faribault, MN 55021
507.334.1847 • fax 507.334.0104
mrgtoolanddie.com

About G&A Partners
A leader in the HR outsourcing industry for 20+ years, G&A Partners has 11 offices across the U.S. and Latin America — including right here in Edina, Minnesota — providing HR, benefits and payroll services to more than 800 clients and 30,000 worksite employees.

For more information: Go to G&A Partners’ website: www.gnapartners.com or call 651-361-7512.

About OECS
OECS’ staff boasts 115+ years of safety experience across a variety of industries — including manufacturing — and specializes in providing employers with high-quality workplace safety services.

For more information: Visit www.oeceans.com

HR For Manufacturing
Free your business from the administrative hassles of HR, benefits, payroll and workplace safety.

Manufacturing companies face a number of HR challenges: maintaining workplace safety, keeping labor and workers’ compensation costs low, staying compliant with employment laws and regulations, recruiting and retaining skilled talent, and more.

A leading national HR outsourcing company, G&A Partners specializes in helping companies solve all these issues (and more) by giving them access to a team of HR, benefits and payroll experts, all for about the same cost of hiring one full-time employee.

G&A Partners comprehensive HR solutions include:
• A suite of workplace safety services, powered by OECS, that includes customized safety and accident prevention programs, OSHA compliance assistance and a dedicated safety consultant.
• A-rated workers’ compensation coverage that gives employers the opportunity to lock in a favorable experience modifier rate (EMR).
• Expert HR support from a team of professionals to help with recruiting, employment law compliance, benefits administration, unemployment claims and more.
• Error-free payroll administration services provided by a dedicated payroll specialist.
• Exceptional employee benefit plan offerings from top-tier carriers like Blue Cross Blue Shield of Minnesota, Guardian, Unum and more.

Need a better HR solution? Visit www.gnapartners.com/industry/manufacturing or call 800-253-8562 to schedule a free business consultation.

HR Benefits Payroll
Until recently, manufacturers haven’t had the convenience of a single point of contact within the college system for their customized training needs. That meant a company like Dayton Rogers would need one contract with Hennepin Technical College (HTC) for training in CNC machining and another contract with Anoka-Ramsey Community College/Anoka Technical College (ARCC/ATC) for training in precision sheet metal. It meant that a company like Donaldson Filtration would need to contact one person at Normandale Community College for training in vacuum technology and another person at ARCC/ATC for OSHA compliance.

Customized training is critical to solving the skilled worker shortage – especially in a tight job market where people are hired before they graduate from a two-year program. But customized training hasn’t always been streamlined for employers. Now three Minnesota colleges are teaming up to promote their programs as a whole and offer seamless service to employers.

In the west metro, HTC, ARCC/ATC, and Normandale are working together to offer comprehensive programs to hundreds of manufacturers in the region.

"Each of our schools has individual strengths," said Rich Kelly with HTC’s Customized Training program. "Our ability to offer collaboratively the strengths of HTC, ARCC/ATC, and Normandale in one program is a huge benefit because it eliminates the need for someone to go to three different schools for three different types of training. We're trying to offer a one-stop shop like many of the industry partners we serve."

HTC offers a large selection of manufacturing courses, from mechanical drafting and engineering to assembly and quality assurance. But some manufacturers need more, whether it’s leadership development courses at Normandale or precision sheet metal fabrication at ARCC/ATC.

"We can go in together and show what each campus has to offer with one point of contact," said Matt Leaf, Associate Dean of Workforce Education at HTC.

In addition to this collaborative approach, many manufacturers may not be aware of the unique and specialized services that individual colleges can offer through customized training. With more people retiring and fewer people looking for jobs, customized training is seen by many companies as the most convenient option to fill specific needs. Although a traditional two-year program is the most comprehensive, there’s little flexibility in the location and timing of the training.

With customized training, courses can be broken into bite-size chunks and delivered on-site or at the college. They’re designed to provide employees with specific skills needed to advance quickly.

One of Normandale’s partners, GN ReSound, has utilized the college for a myriad of needs. Global Human Resources Director Kristina Villones said, “Over the years, we have worked with Normandale in a number of ways. We send individual employees to classes. Normandale has designed and facilitated a custom training program for us. And recently, we utilized grant funding to support a strategic goal for our company.”

Many companies aren’t aware of training outside the college they typically work with that could be helpful. Normandale, for example, offers a wide variety of leadership courses, such as budgeting for managers, supervision training, and change management practices. It also offers one of the only programs in the country that focuses on vacuum and thin film technology for electronics manufacturers. ARCC/ATC is known for its precision metalforming training lab, outfitted with a press brake, laser cutting machine, turret punch press, and other relevant equipment. HTC offers robotic welding in addition to traditional welding. And, it also offers cybersecurity training, which is becoming a greater need for manufacturers.

In terms of costs, manufacturers may qualify for state grants to help cover the investment of customized training, especially if the training would prevent layoffs or encourage new hiring. Up to $409,000 is available to help businesses get the customized training they need.

“What I’m hearing from companies is that they’re more focused on finding a person who fits the organization rather than a certain skill set because the training can come later,” said Jon Olson, Director of Manufacturing Technology Training at ARCC/ATC.

In some cases, companies are working with customized training departments to develop an apprenticeship or internship program for an assembly worker or forklift operator to become a machinist or plant maintenance worker. In other cases, it means promoting employees who are among their best technical workers but have no formal training at being a cell leader or shift supervisor.

Even the most highly-skilled employees stand to benefit from customized training. Some engineers may benefit from one or two days of hands-on machining, for example.

“Our three colleges have super strong and unique programs and we’re working harder to collaborate so it’s seamless, faster, high quality, and less paperwork for the companies,” said Jeff Hudson, Program Director at Normandale Community College. “It’s all about increasing the value we provide companies.”

MELISSA DEBILZAN is a writer for Precision Manufacturing Journal. She can be reached at melissadebilz@yahoo.com.

"We aim to be flexible. If you have a need, just let us know. We can work with our expert faculty and outside resources to craft a course or program specific to your needs."

- Matt Leaf, Associate Dean of Workforce Education

**Fast Facts:**
- 99 percent of students find jobs within HTC’s network of business partners
- The college currently offers 45 fields of study with more to come.
- Current customized training clients include: Polaris, 3M, Toro, Medtronic, B J. Axia & Sons, Egan, Uphol-Stith, and Xcel Energy.

**MATT LEAF**
Associate Dean of Workforce Education
(952) 995-1345
matt.leaf@hennepintech.edu

---

**Hennepin Technical College**

**Traditional Training Programs:**
- Automation Robotics Engineering Technology
- Electronics Technology
- Engineering CAD Technology
- Fluid Power Engineering and Motion Control
- Industrial Building Engineering and Maintenance
- Machine Tool Technology & Quality Assurance
- Plastics Engineering Technology
- Welding & Metal Fabrication

**Customized Training Programs:**
- G&D T
- Blueprint Reading
- CNC Setup/Operation/Programming
- Metrology
- Welding & Fabrication (MIG, TIG, Flux Core, Robotic, CNC Plasma Cutting)
- Leadership for Manufacturing
- Robotic Programming/Setup
- Automation (Mechatronics)
- Electronics Troubleshooting/Repair
- Maintenance (Troubleshooting, Preventative Maintenance, Mechanical, Electrical, Electronic)
- Plastics (Injection Molding, Thermoforming, and more!)

---

**See More detailed information on the next 3 pages.**

**INDUSTRY SPOTLIGHT**

**Upskilling Colleges Team Up to Deliver Customized Training**
by Melissa Debilzan

**INDUSTRY SPOTLIGHT**

**Hennepin Technical College**

**INDUSTRY SPOTLIGHT**

**UPSKILLING**

**INDUSTRY SPOTLIGHT**

**DELIVER CUSTOMIZED TRAINING**

**INDUSTRY SPOTLIGHT**

**PRECISION MANUFACTURING**

**FIND SUPPLEMENT**

**FIND SUPPLEMENT**

**PRECISION MANUFACTURING**
Anoka-Ramsey Community College / Anoka Technical College

Traditional Training Programs:
- Sheet Metal
- Welding
- Blue Print Reading
- GD&T
- SolidWorks
- Six Sigma
- Applied Shop Math
- Dimensional Metrology
- Statistical Process Control
- Lean Manufacturing
- Medical Device

Fast Facts:
- Over 97 percent employment rate in its short-term Career Education programs.
- Trains over 4,000 non-credit students each year at employers’ locations and/or the campus.
- A top recipient of training grants through the Minnesota Job Skills Partnership (MJSP) to provide professional and workforce training to manufacturers.

ARCC/ATC is known for its precision metalforming training lab, outfitted with a press brake, laser cutting machine, and turret. The manufacturing machine tool program is complete with basic to advanced machine tool equipment and programming software.

JAMIE BARTHEL
Executive Director
(763) 422-6082
jbarthel@anokatech.edu

"Our most successful program has been precision sheet metal fabrication. We’ve put over 300 people through the program and almost all have gotten jobs in the industry. Ajax Metalforming Solutions has hired 19 to 20 people over the years from the program. Other companies send their employees to the program for skill upgrades."

- Jamie Barthel, Executive Director at ARCC/ATC.

Normandale Community College

Fast Facts:
- Normandale is awarded workforce development grants each year to work with Minnesota employers to provide affordable and high-quality training.
- A sample of Normandale clients includes Donaldson, Medtronic, GN ReSound, Seagate, Polar Semiconductor, Consolidated Precision Products.
- Normandale serves over 6,500 learners each year through continuing education and customized training.

"Over the years, we have worked with Normandale in many ways. We send employees to classes. Normandale has designed custom training programs for us. And recently, we utilized grant funding to support a strategic goal for our company. We appreciate their responsive and high-quality approach to meeting our workforce training needs."

- Kristina Villones, Global Human Resources Director, GN ReSound

Organization Development
- Supervision and Management
- Project Management Programs
- Change Management Programs
- Communication and Presentation Skills
- Cultural Competency

Data Analysis
- Certificate in Data Analysis
- Statistical Process Control
- Business Intelligence (BI) Tools
- MS Excel / Access Certificates
- SQL – Structured Query Language

Continuous Improvement
- Six Sigma Yellow, Green, and Black Belt
- Lean Manufacturing
- ISO Certifications
- Failure Mode and Effect Analysis
- Problem Solving Techniques

Production
- Certified Production Technician
- Quality Practices
- Manufacturing Processes and Production
- Maintenance Awareness

Vacuum and Thin Film
- Vacuum Technology Certificate
- Vacuum Analysis and Troubleshooting
- Thin Film Deposition
- Mechatronics

Agile and Scrum
- Certified Scrum Product Owner
- Certified ScrumMaster

Training can be delivered at Normandale, at a company, or online.

INDUSTRY SPOTLIGHT

CONTINUING EDUCATION & CUSTOMIZED TRAINING
(952) 358-8343
ncal@normandale.edu
www.normandale.edu/CE


INDUSTRY PROFILE

Minnesota PIPELINE Program
A Dual-Training Approach to Building Skilled Workers
by Melissa DeBlizan

Blake Pleschourt didn’t plan to become a skilled machinist after graduating high school. Like many high school students, he was encouraged to get a four-year degree of some kind, even though he wasn’t sure what he wanted to do. It wasn’t until he was introduced to a career in manufacturing and a unique employment-based training program that he learned he wanted to become a machinist.

Through the Minnesota PIPELINE (Private Investment, Public Education, Labor and Industry Experience) Program, employers drive the conversation to develop competency-based, dual-training programs. Individuals like Pleschourt participate in structured-on-the-job training designed by the employer and pair that training with related instruction, typically with an external training provider. Together, these two modes of learning create a powerful learning experience for that employee. The employer can see his or her employer is willing to invest in their future; the career pathway is clear. Additionally, the employees can have their education paid for in their pursuit of industry-recognized credentials.

K&G Manufacturing is where Pleschourt works. He is one of four employees at the company who have gone through the PIPELINE Program since 2016. For two years, he worked part time at K&G and took classes at a local technical college to fulfill the requirements of the program’s dual-training model. He has since graduated with a degree in machine tool technology and is working full time as a Level 1 machinist. Now Pleschourt is interested in furthering his skills. He’s planning to join the team of engineers at K&G and continue his training.

The PIPELINE Program has helped the company fill positions for two machinists and one production coordinator in recent years, said Marv Urias, K&G Manufacturing’s Recruiter and Human Resources Specialist, which were critical for keeping up with customer demand. The company is still looking for five to six more machinists and plans to continue to apply for grant funding through the PIPELINE Program.

“Without qualified people, our equipment and materials are just sitting there, and we aren’t making a profit,” Urias said. “The PIPELINE Program takes some time to coordinate on our end, but it’s a good return on investment. Every time we visit a college, we explain the PIPELINE Program to manufacturing students and how it can benefit everyone involved.”

Established in 2014, the PIPELINE Program works with employers to change the conversation from how they can find skilled workers to how they can give workers the skills they need. Department of Labor and Industry staff members consult with manufacturers of all sizes about their hiring challenges, identify a dual-training program that fits their needs, and connect them to resources at no cost.

“With the unemployment rate being low and our company being outside the Twin Cities, we need all the help we can get with recruitment,” said UMC Training and Development Specialist Beth Metzger. “PIPELINE helps us get the skills we need.”

Over the past two years, six employees have gone through the program and five are still on staff. Some of the employees started out as high school students participating in job shadowing who weren’t sure what they wanted to do after they graduated. When UMC explained the program, they were able to begin taking classes and working part time for the company during their senior years.

“It’s a benefit to offer potential and existing employees this ‘earn while you learn’ model,” Metzger said. “They’re not just working and they’re not just going to school. They’re actually dual trained, so it benefits everyone.”

“PIPELINE helps us get the skills we need.”
Beth Metzger, UMC Training and Development Specialist.

Grant funding available through the Minnesota Office of Higher Education (OHIE). A total of $150,000 is available to each employer each cycle. A single employee can be funded for up to four years of training.

Currently, 136 manufacturers are engaged in the PIPELINE Program across the state, including Peguot Tool & Manufacturing, Jones Metal, Park Industries, Yeager Machine, 3M, Dotson Iron Castings, and Reell Precision Manufacturing. Employers have established 84 programs focused on training occupations in advanced manufacturing, receiving $1.5 million in grant funding to support the related instruction component of their programs.

Ultra Machining Company (UMC) in Monticello is another manufacturer that has been a leader in the PIPELINE Program since 2016. The job shop is looking to hire at least 15 machinists in the coming year and sees PIPELINE as a valuable workforce development and employee recruitment tool.

“We don’t just hire people, we train people to a specific position,” said Beth Metzger. “We work hard to train people to the level of competency we need, and we aren’t making a profit.”

Tyler Knudson, UMC, examines components to the CNC milling machine.

“Without qualified people, our equipment and materials are just sitting there, and we aren’t making a profit.”
Marv Urias, K&G Manufacturing

INDUSTRY PROFILE

QUALIFIED POSITIONS IN ADVANCED MANUFACTURING

Employers advise the PIPELINE Program team about their in-demand occupations. Next, employers work with PIPELINE staff members to lay out core competencies an individual would need to succeed in these careers. Below are the occupations currently identified for the PIPELINE Program that have employer-validated competency models and that are available for grant support.

- Flexo technician
- Machinist/CNC operator
- Maintenance and repair worker
- Mechatronics
- Quality assurance/food safety supervisor
- Welder
- Machinist/tool and die
- Quality assurance technician
- Safety technician
- Logistics and supply chain manager

In addition to advanced manufacturing, the PIPELINE Program addresses workforce needs in three other high-growth industries: information technology, agriculture, and health care services.

The next PIPELINE Program Dual Training Grant cycle opens April 1, 2019, and closes May 17, 2019.

GET INVOLVED
- Get assistance from PIPELINE Program consultants to begin your company’s own dual-training program.
- Take part in PIPELINE Program Industry and Competency Council meetings to advise and create new workforce development initiatives related to apprenticeship and dual training.
- Sign-up for PIPELINE Program email messages at www.dli.mn.gov/pipeline.

CONNECT WITH OUR TEAM
Online: www.dli.mn.gov/pipeline
Email: pipeline.program@state.mn.us
Phone: 651-284-5353

Tyler Knudson, UMC, examines components to the CNC milling machine.

Blake Pleschourt, K&G Manufacturing takes a moment to glance at the camera during his work on a CNC horizontal mill machine.

“Without qualified people, our equipment and materials are just sitting there, and we aren’t making a profit.”
Marv Urias, K&G Manufacturing
**Minnesota Maker Movement**

Places Where Ideas Become Reality

by Wayne Wilcox

Think about Henry Ford, Albert Einstein, or Nikola Tesla - all having some sort of visionary thought about making something different, something that may work better or give a new meaning to our lives through pure invention.

As history has shown, their ground-breaking ideas may not have been seen the light of day if each had not employed the brain trust of their various groups of like-minded tinkerers. Wherever the inspiration comes from, for people throughout time, men, women, and children of all ages, races, and beliefs are still making things, still trying to create something from nothing, and they are doing it together, more often than before.

It’s called the “Maker Movement.” Born out of the idea that more brains are often much more productive over one, it’s pure brilliance.

In Minnesota alone, there are maker shops cropping up all over the landscape. For the most part, they are set up as groups to join, and the makers pay a nominal monthly fee to have access to a bevy of metal, woodworking, and other equipment. Training and certification classes are often available and something a maker can’t get tinkering on his or her own - someone to help, someone to bounce ideas off of, or a bunch of people for that matter.

As an example, The Hack Factory located in Minneapolis, has grown over the past few years not only in size but in membership, as well. Touring the facility, most anyone can identify the vast amount of thought that must have gone into the layout of each area and it’s extremely “user-friendly” attitude.

Within The Hack Factory, you’ll find just about every type of machine, tool, and workstation for metal and woodworking projects. Many workstations require a certification in order to operate the equipment, however, training classes are scheduled regularly on-site and certification is achievable. There are many workstations within the facility, everything from heavy-duty sewing machines to one big, powerful welding rig. There is even a Ham radio studio, a couple nice 3D printers, paint and finishing booths, laser cutters, and several CAD-ready computer stations.

Makers from all walks of life can become members. They can store their projects on-site and many use the facility as meeting places to conjure up the next project they are contemplating together. It is a hub of possibilities, creativity, and inspiration.

Several other maker studios are scattered throughout the state, and if you’re interested in learning more, a simple Google search will most likely identify which is closest to you.

Some cater to a younger crowd - like the one sponsored by the Minnesota Children’s Museum.

“With the maker space movement becoming more recognized, more studios are becoming available, specifically in the Twin Cities,” according to the Museum’s website. “The Minnesota Children’s Museum is now one of five maker space studios in the Twin Cities – the others are Twin Cities Makers, Nordeast Makers, The Hack Factory, and MPLS Make. These studios are not your average coloring spot: they are equipped with woodworking, 3D printers, laser cutters, and software – to name a few of the impressive tools. Here at the Museum, our maker space provides a sewing machine, electrical circuits, Plexiglas®, and more. By helping maker spaces become more available to cities and communities the doors to success are opened.”

Yet, the maker movement story can’t be told without shedding light on all of the tinkerers working tirelessly in their garages and basements. Occasionally, a tinker’s hobby shop can become a legitimate business offering.

Of note, consider Brian Hitt from the Forest Lake area. In his corporate career working for companies like Polaris, Hitt’s passion for motorsports and power sports turned into a tinkerer’s dreams shop of making high-end metal castings for the huge tractor-pull industry. He eventually named his small business “Northwoods Engineering” and began making “Better than Billet” cylinder heads. Many of his customers became tractor-pull champions and from there, Hitt decided to open a full-sized precision machine shop.

Today, he owns “Northwoods USA” located in Ham Lake. They still make the award-winning Cylinder heads, fly wheels, and pistons for the tractor-pull industry, but now have expanded to service many new markets with an emphasis on their proven engineering expertise.

“We like to tackle the hard stuff,” Hitt said. It seems it all began with trying to make something that was better. “That kind of mentality has never left us and I credit being a tinkerer with an engineering mindset,” he stated.

It appears that is the drive of many makers around. Ideas can come from most any place, any time, and any one. Now, there are places to go, to work your idea and quite literally, see what you can accomplish. After all, Henry, Albert, Nikola, and Brian all started by making something, somewhere, and most likely, with the help from someone else.

WAYNE WILCOX is the owner of Wilcox Design Group, located in Dassel. He can be reached at 652-670-3811 or wayne@wilcoxdesigninc.com.
Kent Smith started Diamond Tool & Engineering as a small shop in 1988, today the shop employs more than 35 team members at the Bertha, Minn. facility and continues to add capacity every year. As mold makers in the medical and consumer industries, Diamond Tool has extremely high accuracy requirements and a need for flexible capacity – particularly in medical device work. Producing tools for difficult materials including Liquid Silicone Rubber (LSR) and Metal Injection Molding (MIM), the company finds itself machining everything from Cadie and H-13 to Poco 5 Graphite and 420 Stainless.

Because of the high accuracy requirements demanded for Diamond Tool’s medical mold business, machining had become a challenge, with a bottleneck in high-speed milling had become a challenge, with a bottleneck in high-speed machining, despite Kent’s first purchase was a UH650L speed mills, each machine would need to reliably hold a tenth (0.0001”). This extremely tight tolerance requirement was something that Diamond Tool could not previously deliver, but which was increasingly being demanded by customers in higher-end markets. In order to accept the new high-value work Kent was pursuing, Diamond Tool determined to acquire new high-speed machining capacity. In order to ensure the success of this growth initiative, Diamond Tool had strict requirements. Any high-speed milling equipment purchased would need to have the flexibility to handle both graphite machining and hard milling as needed, in order to produce both electrodes and molds.

Additionally, because of the tight tolerance requirements of Diamond’s medical applications, and plans to produce electrodes using the new high-speed mills, each machine would need to handle both graphite machining and hard milling as needed, in order to produce both electrodes and molds. The UH650L also includes an integrated M-Code relay feature that supports flexible graphite machining by allowing the mill to automate its own graphite package. The relay, essentially the “brain” of the Sodick graphite package, converts what would traditionally be a manual Torit dust collection system into an integrated part of the CNC system, issuing commands to the device via standard M-Code inputs familiar to any machinist. The relay programs on and off timing to extend the useful life of the mill’s dust collector and reduce power consumption.

One year later, Diamond Tool is making progress in their mission of becoming their customers’ #1 supplier of choice. Their improved capabilities and reliability has strengthened Diamond Tool’s position among more lucrative, high-end customers and enabled the firm to take on new work that would not have been accessible previously, including the small, tight tolerance medical devices endemic to Minnesota.

While everyone would like to leverage the benefits of High Efficiency Machining (HEM) strategies to take their manufacturing to the next level, some are hesitant to get started. The primary reservations are that the learning curve will be long and the transition process will be expensive due to new tooling, holders, fixturing, software, etc.

The reality is that HEM can be up and running in less than one day. To do a quick recap of HEM, here are the key benefits:

- Decrease cycle times by 50 to 75 percent.
- 10 times longer tool life.
- Provides very reliable and repeatable programs.
- Benefits all machines, both milling and turning.

While the benefits of implementing HEM far outweigh any perceived hurdles, here are the key components to ensure a fast and successful implementation.

**SOFTWARE**

- Your CAM software needs to have advanced HEM roughing.
- Some CAM software developers have their own HEM strategies. If your software does not, augment your existing software with a solution that provides the HEM strategy best suited for your application.
- Not all HEM programs are created equal.

Helping You Maximize Your Energy Dollars

CenterPoint Energy’s process efficiency solutions will save you energy AND money.

- Equipment rebates: Save on process boilers, industrial equipment tune-ups and stack economizers. CenterPointEnergy.com/ProcessRebates
- Custom Rebate Program: Reduce your costs for customized high-efficiency natural gas-saving projects. CenterPointEnergy.com/MMCustom
- Design/engineering programs: Offering Engineering and Certification Assistance, Recommissioning, Energy Design Assistance and Process Efficiency programs. CenterPointEnergy.com/EngineeringPrograms
- Process Steam Trap Audit Program: Where is your system losing energy and costing you money? We’ll pay $15/tested trap, up to 100 percent of the audit’s cost. Plus, you may qualify for a custom rebate. CenterPointEnergy.com/ProcessSteamTrapAudit

Contact Jessica Miller at 612-321-4390 or Jessica.Miller@CenterPointEnergy.com.

Over a Century of Trusted Service

(continued on page 24)
out the effects of changes in cutter load and engagement that occurs with more basic cutting motion, but even these will provide some benefit for general applications.

TRAINING
- Knowing how to apply HEM to your parts is key.
- Getting trained on HEM to your parts can typically be done in one day or less.
- Having a local resource for advanced training, application advice, and technical support can dramatically reduce the learning curve and remove barriers.

EQUIPMENT
- Nearly every CNC machine will benefit from HEM.
- While every machine will benefit from HEM, each machine has its pros and cons when it comes to how aggressive HEM can be implemented.
- There are two main factors that determine how well a machine will perform when implementing HEM.
- Machine rigidity, the more rigid the better.
- Machine speed, the faster the better. This encompasses the processing speed of the controller, the mass of the moving components, and the acceler and decel curves of the servos and drives.

TOOLING
Use the right tool for the job.
- Any tool can be used with HEM to achieve faster cycle times and longer tool life
- With regard to quality tool holders, the more rigid the better. While there are benefits to shrink fit holders and milling chucks, a standard endmill holder with retaining set screw provides enough rigidity for many applications.
- With today’s highly-specialized tooling, using general speeds and feeds for a given material simply is not good enough. Obtain application specific cutting parameters from your tooling manufacturer. This data is often available online.

APPLICATION SPECIFIC DATA
Each job can provide new challenges.
- Proper work holding plays a major role in overall setup rigidity.
- Chip evacuation is critical on Vertical Machining Centers (VMCs) as large amounts of material are being removed in a short amount of time. The use of air blast, coolant, oil, mist, etc. must be used.

Getting started with HEM can be as simple as processing one common part. Work with your tooling vendor and software support staff to setup moderate cutting conditions. As you become more comfortable with the process and learn the performance limits of your machine tool and tooling, you can adjust the cutting parameters to be more aggressive. You now have a proven process that can be reused over and over on that machine, cutting the same material, with the same cutting tool.

ROGER PETERSON is a senior Mastercam trainer and support consultant at ProtoTech Engineering. He can be reached at 952.881.5588 or rpetersen@prototech-engineering.com.

Colburn Manufacturing Family Bonds Help Foster Company Culture
by Nancy Huddleston

From the moment the door opens at Colburn Manufacturing Company, you are family. Shop dogs Lacy, Nala, Oliver, and Marley welcome with barks and tail wags. Heartfelt greetings from all four members of the Larson family follow as the talk turns to business, a sense of belonging begins to percolate.

“When I started on my own, I never envisioned it would get to where it is today,” said Scott Larson. “But the longer I did this for myself, the more I realized I couldn’t do it all by myself.”

He surrounded himself with good people, taking to heart the lessons he acquired when he worked as a supervisor for other manufacturers. “I learned firsthand the importance of skilled people that work in a company,” Scott said. “Investing in people, and especially quality people, and in culture are a big part of this company’s vision. We make our employees a top priority.”

Scott didn’t start Colburn Manufacturing with the idea of opening a family business. His wife Cheryl had her own career and their children were still growing up. But, as the business steadily grew, his son, Clint, was the first to join him, followed by his wife Cheryl. And finally his daughter, Liz, “joined after I asked a few million times,” Scott points out with a smile.

“It was always clear that Clint would join the business,” observed Cheryl. He went to the shop with his dad when he was a boy to wash parts, eventually working up to running basic machines, and cleaning the shop. But really, Clint jokes, “I’d go because they had cable in the garage.”

After high school Clint went to St Cloud Technical College, worked at another shop, and then came to work with his dad. “I realized the benefit of working for an owner who was a machinist and someone who has seen it all,” he said. Cheryl was busy with her own career as a physician assistant in internal medicine, but also helped out with accounting for the family business. She’d been retired as a physician assistant for about three months when Colburn Manufacturing purchased a bigger building in Fridley in 2014. During this time, investments were made into more machines, a camera inspection system, microscopes and tumbling machines, and more tool sharpening machines. In 2016, the company achieved certification for both ISO 9001:2008 and ISO 13485:2003. In 2017, Colburn updated its certification to ISO 9001: 2015 and ISO 13485: 2016.

“The timing was perfect, we’d bought a building, and we were poised for growth,” Cheryl said. Her background in accounting, business, and communications were an asset, and helped solidify her role with the business.

The last holdout was Liz. Although she worked on and off in the shop growing up, she took a different path, graduating from St Cloud State University with a degree in Spanish and business entrepreneurship. Afterward, she embarked on her own career in the hospitality industry, but was eventually drawn into the family business to embark on a new opportunity.

WORKING TOGETHER
Working together isn’t hard for the Larsons, who say their natural strengths and interests have brought them to where they are today in the company leadership matrix. “We’re not perfect by any means, but we all have the same vision,” Cheryl said.

As President, Scott oversees sales, quotes, and marketing, coordinates prototype development and is the EOS visionary. Cheryl is the Chief Financial Officer, taking care of corporate financial forecasting, human resources and talent development, ISO implementation, and is the EOS implementor. Clint is the Application Engineer, in charge of programming, inspections and machining, and corporate problem solving. And Liz is the Director of

Compressed Air Downtime is Costly and Frustrating
Fluid-Aire Dynamics provides clean, reliable, efficient compressed air and assures minimal downtime.

Contact Us Today! 866.907.7931 www.fluidairedynamics.com

Fluid-Aire Dynamics
Managing Your Process Efficiently

Minneapolis | Chicago | Milwaukee | San Antonio

Leadership runs in the family at Colburn Manufacturing. From left to right: Scott Larson, Clint Larson, Liz Larson, and Cheryl Larson.
Operations and tracks jobs, orders materials and tools, and works on ISO continuous improvement.

“We know each other’s strengths, and more importantly, we know what gets on each other’s nerves and pushes buttons,” said Liz. “We work well together and our skills overlap each other. Each person has their own way that they roll, and we know those.”

Clint believes that because they are family, they have an advantage over other companies. “We have trust with each other and we have the best interests of the company in mind,” he said.

As the company has grown, the bond the Larson family has with each other has permeated the company culture. There are potlucks, activities, and other special celebrations throughout the year. “Our culture is very important, especially since we’re a growing company,” Cheryl said. “We continually share with our employees that if we grow, you grow. So we offer fun activities, provide bonuses, good health care, profit sharing, and 401(k) opportunities.”

SENSE OF PRIDE

When asked what makes them proud to work at Colburn Manufacturing, Scott is the first to answer – defense projects. “We’re protecting our military with parts for the F-19 fighter jet ejection seat and with customized parts for vision systems,” he said.

“I take pride in the end product and the high level of precision and quality,” Clint added. “Even if it eats into our cycle times, we have extremely high standards – some of our parts are jewelry quality.”

And Cheryl points to the parts for cochlear implants that Colburn Manufacturing has provided which provides a higher quality of life. Their sense of pride is also shared by their employees, according to Clint. “Our team is not satisfied with the same level of quality – they are always looking to step it up,” he said. “And everyone works well together to get to the next level.”

“It’s nice to see the younger employees come in with experience that the older ones don’t have and see that natural curiosity come to the surface between them,” Cheryl added. “They feed off each other and see value in what they bring to the table.”

Colburn Manufacturing is named for Scott’s grandfather, who immigrated to America when he was 16 years old from Oslo, Norway. The company has specialized in CNC Swiss precision machining since 1999, and manufacturers parts for the electrical connector, fuel and gas, medical, elevator, high-speed labeling, and decorative hardware industries. NANCY HUDDLESTON is the Editor and Publications Manager for Precision Manufacturing Journal and can be reached at nancy@mpma.com or 952.564.3041.
G54. 2 P0
G91 G28 Z0. M05
G28 Y0.
G30 X0.
M46 M43
G28 A0. C0.
M01
G00 G20 G40 G80 G90
(O.5 LOLLIPOP CUTTER)
N0014 T14 M06 T4
S5000 M03
G54 G00 G90 X1.1607 Y-1.4439
G43 H14 Z5.15
G54.2 P1
M43

Reliable and error-free Gcode. Free basic post processor edits.
One post processor per machine, regardless of the application.