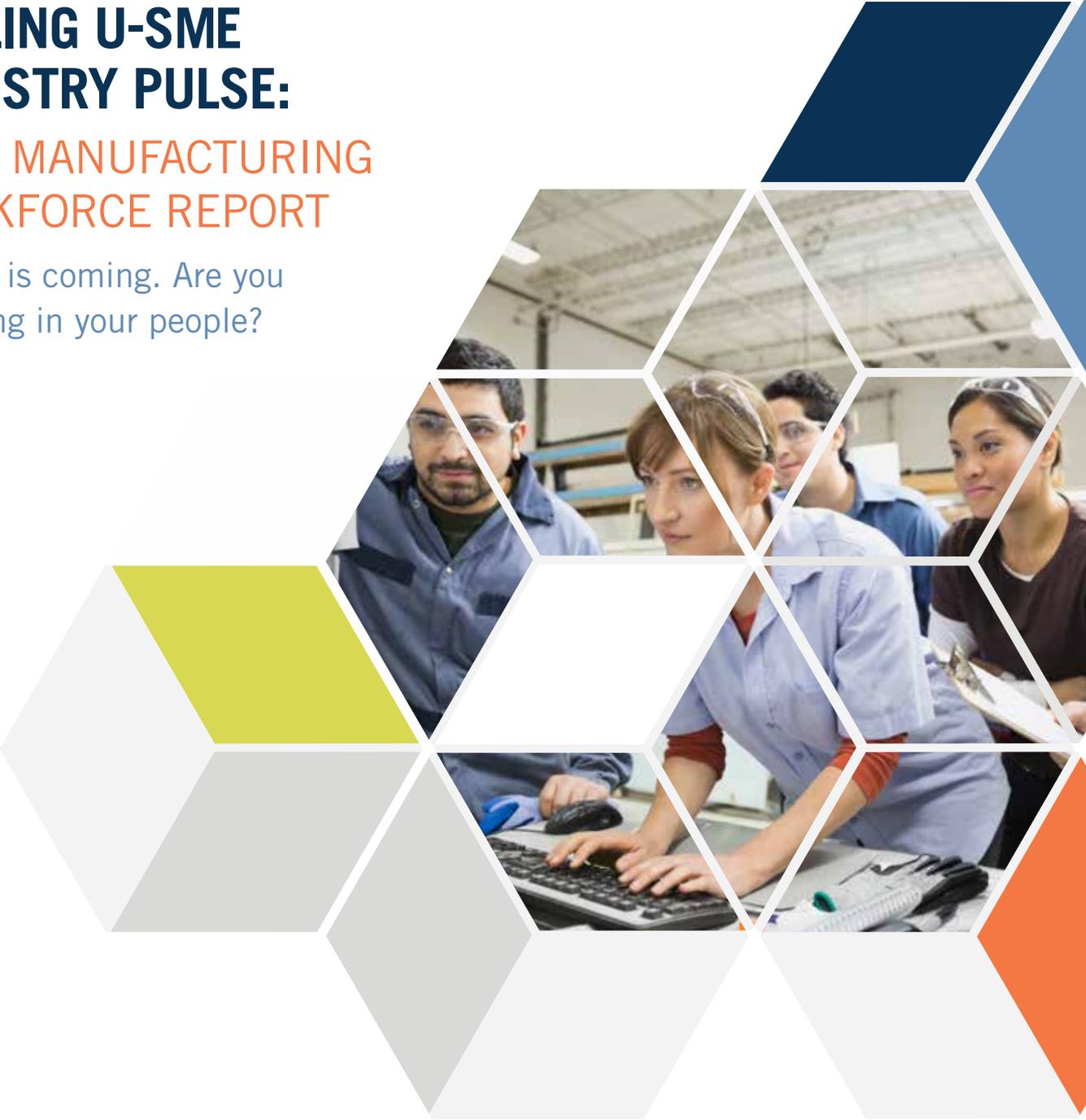


# TOOLING U-SME INDUSTRY PULSE:

## 2018 MANUFACTURING WORKFORCE REPORT

Growth is coming. Are you  
investing in your people?



TOOLINGU

sme<sup>®</sup>

# MANUFACTURERS: TIME TO PAY ATTENTION

For years, the manufacturing industry has been sounding the alarm about the threat to growth caused by “the skills gap,” a phrase repeated so often it has now become a nearly invisible warning.

**Simply put, there are too many open jobs and not enough skilled workers to fill them — to the tune of up to 2 million jobs.<sup>1</sup>**

For an industry charged with making things, a slowdown due to lack of talent can disrupt businesses of all sizes and, ultimately, the national economy. This is particularly troubling now as *The Wall Street Journal* reported in July 2018 that, “The economy appears poised to expand this year at the fastest clip since the recession ended in 2009.”<sup>2</sup>

And as the Tooling U-SME Industry Pulse: 2018 Manufacturing Workforce Study shows, little has changed in the industry since the dangers of retirements, a decreased talent pipeline, and the need for new, advanced technology skills first became front-page news.

## THE DISCOURAGING RESULTS REINFORCE THAT THE BARRIER TO ADDRESSING THE SKILLS GAP IS THE STATUS QUO.

In other words, we are the culprits – at least those who fail to act. The winners are those who recognize the danger and strategically change the direction of their companies.

Clearly, the manufacturers who are not winning are those continuing to do the same things as five years ago — yet expecting a different result.

### But it's not too late.

By focusing now on top priorities such as finding skilled new hires, upskilling the incumbent workforce, and retaining employees, companies will be propelled toward productivity and profitability.

The Tooling U-SME Industry Pulse: 2018 Manufacturing Workforce Report outlines the study findings, and provides insights and proven action steps to help you invest in your company's future.



## Skilled Talent Needed

Three of the top challenges companies face in the next three years revolve around developing a skilled workforce. And these challenges directly affect another top challenge: Expanding business, which nearly nine out of 10 (88%) manufacturers said is a top concern.

**Manufacturers say their top workforce challenges are:**



## Key Findings

- The skills gap is a real threat to growth. Ignoring this challenge won't make it disappear.
- Innovation through the integration and adoption of advanced technologies is at risk due to a lack of skilled workers to implement smart manufacturing and other new technologies, automation, cybersecurity, and big data/analytics.
- Only two out of five companies (41%) agree that their company trains people to develop the right skills.
- Respondents blame lack of management commitment and resources such as funding, time, and training.
- Many actions companies can take to develop and retain employees are under their control, yet the majority of manufacturers are not taking these steps.
- Employers are feeling the impact of the workforce shortage. Fortunately, some are starting to invest in programs internally as well as in their local community employment pipelines.



# TECHNOLOGY CHANGES THE GAME

The manufacturing industry is changing rapidly, with advanced technologies providing amazing opportunities for increased efficiency, improved quality, shorter cycle times, optimized energy, greater innovation, and reduced costs.

## Yet many companies are challenged to implement:

82%

Smart manufacturing technologies

81%

New technology

78%

Automation

73%

Cybersecurity

69%

Big data and analytics

Technology is accelerating at a pace faster than the pace of people development. Skill sets have changed, and applicants, as well as incumbent workers, often don't have the right skills to fill needed jobs. Manual processes are being replaced, and today's workers must be trained in everything from analytics to robotics.

Many manufacturers purchase a piece of equipment, yet only tap into a fraction of its potential. Why? Because they haven't invested in the training needed to ensure those working with the machine become experts in programming, setting up, operating and maintaining it.

**“Technology is advancing dramatically, and to keep moving forward, the key is continuous improvement around equipment, processes, and employees.”**

*– Michael Munday, CEO of Arwood Machine Corp.*

For instance, a factory may add additive manufacturing, but only a small number of workers may understand the technology. For productivity and financial gains, it is imperative that team members in all departments are fully trained to understand 3D printing: maintenance, engineering, quality and inspection, production, programming, and design with additive in mind.

**Fully trained employees drive innovation. Train workers to fully understand equipment and technology so they can improve processes and generate new ideas.**

**INSIGHT**

# GROWTH DEMANDS INVESTING IN PEOPLE



To address workforce challenges, survey respondents say they are:

- Partnering with educational institutions
- Enhancing compensation: raises, recruitment bonuses, and retention bonuses
- Offering 100% tuition reimbursement
- Providing internal training
- Creating an apprenticeship program
- Increasing their training investment
- Strengthening onboarding processes
- Hiring full-time trainers
- Starting a pay-for-skill system
- Building qualification profiles



## TALENT FOR SMART MANUFACTURING

According to SME's Manufacturing in the New Industry 4.0 Era Survey<sup>3</sup>, the top challenge for manufacturers implementing smart manufacturing solutions is finding skilled people.

To grow and innovate, it is important that manufacturers train and develop team members on the integration and use of technology. With nearly half (47%) of manufacturers planning to invest in digital technology solutions in the next 24 months, now is the time to determine the impact on staffing, ramp up recruiting, and launch training for both new hires and incumbent workers. Successful manufacturers are investing in training programs and using competency models to build the capabilities they require to remain competitive.

### INSIGHT

Business growth and people development go hand-in-hand, and must be addressed through an effective training and development strategy followed by implementation.

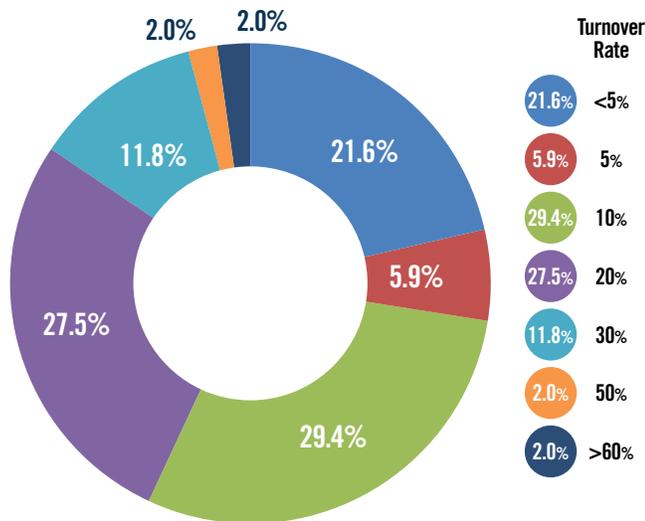
# TURNOVER AND RETIREMENTS THREATEN INDUSTRY

The **lowest unemployment rate** in years, **along with high turnover** and **looming retirements**, are adding extreme pressure to the workforce equation.

## THREAT: Loss of High Performers

While turnover of low performers is healthy, losing significant numbers of high performers can indicate trouble. It is concerning that two out of five manufacturers (43%) indicate an average 20% or higher annual turnover.

### Companies' Approximate Total Annual Turnover Rate (%)



## THREAT: Loss of Embedded Knowledge

Baby Boomer retirements are starting and will continue. The transfer of incumbent knowledge must take place now. The status quo is no longer an option — structured programs that capture institutional knowledge are now a “must have” for manufacturers looking to grow their business.

- More than one third of respondents indicated that over 20% of their workforce will be eligible for retirement during the next three years.
- Three in five (59%) said a loss of embedded knowledge due to movement of experienced workers is a challenge due to the skills gap.

## HELP WANTED

### IN-DEMAND SKILLED PRODUCTION POSITIONS:

59% CNC machinists

55% Machinists

47% CNC programmers

45% Maintenance technicians

43% Entry-level production

40% Production operators

38% Quality control technicians

34% Tool and die makers

### IN-DEMAND ENGINEERING POSITIONS:

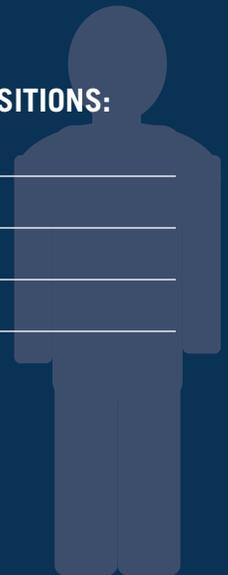
34% Manufacturing engineers

29% Mechanical engineers

26% Quality engineers

24% Process engineers

23% Design engineers



Once hired, skilled production workers and engineers require strong onboarding and skills qualification.

INSIGHT

# ANNUAL COST OF TURNOVER



A frequent complaint of manufacturers is that they don't have the funds to invest in a standardized training and development program, yet this cost is dwarfed by their annual cost of turnover (CoT).

**For example, if a company of 100 employees loses 20 employees in a year (20% turnover), and CoT averages \$7,500 per employee, annual CoT is \$150,000.**

In fact, many manufacturers report turnover that is much higher, especially for more senior positions such as experienced/mid-level production workers, production supervisors and management, and engineers. While losing an entry-level employee may cost \$7,500 or more, the loss of an engineer could cost more than \$30,000. And, these are conservative estimates.

Most respondents indicated that they do not include the cost of temporary labor to fill the gaps, loss of productivity (e.g., safety, scrap), and opportunity costs such as lost business, making the CoT even more expensive.

**70%**

track screening costs, HR time, onboarding costs and training costs

**57%**

do not track temporary labor to fill gaps as part of CoT

**68%**

do not track loss of productivity costs such as machine downtime, safety issues, and scrap

**77%**

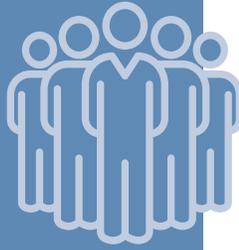
do not track opportunity costs such as lost business associated with the skills gap



## INSIGHT

Significant turnover indicates a company is not focused on strategies to retain and grow its employees. "Brain drain" from steady senior talent exits can be serious. When entry-level employees leave, this indicates introductory programs such as onboarding, upskilling, and outlining clear career pathways need to be strengthened.

# 5 BEST PRACTICES FOR BUILDING A STRONG WORKFORCE



World-class companies outperform others in large part because they manage and train their workforces differently. For companies that recognize the urgency but don't know how to improve their learning and development processes, here are five best practices for building a high-performance workforce.<sup>4</sup>

- 1 Identify the business objectives.** A successful training and development program must have the support of senior management. The best way to do this is to demonstrate learning's impact on the business. Tie your training program to the bottom line.
- 2 Define performance-based competency models.** Having a system in place to codify knowledge and skills required for a specific job role is critical to ensure individuals are successful in their roles. This also ensures institutional knowledge is passed on to the next generation as veteran workers retire. Today, more employers are using competency modeling to provide a structured way of looking at job progression, job skills assessment and workforce planning.
- 3 Align learning solutions to develop knowledge and skills.** A well-defined competency framework and aligned learning plan will eliminate unnecessary or redundant training, and maximize training time to develop the knowledge and skills a particular employee needs.
- 4 Structure your on-the-job training (OJT) program.** Performance-based training programs should require the use of standardized OJT tools and techniques to ensure consistent delivery of training. Companies should also ensure they "train the trainers," investing in developing their OJT mentors and instructors so they have competencies in adult learning, mentoring, and delivery of OJT sessions.
- 5 Develop and execute a measurable impact study.** At the start of program design, a company should document goals related to production, quality, innovation, and employee retention. Later, the team can refer back and see how the program measured up.

## Blueprint for Talent Development

Continuous education and performance support, **which are within a company's control**, need to be part of every learning and development strategy to build productivity and profitability. However, many companies still have tremendous opportunity for improvement:

- Three-quarters (76%) say their company does not have a talent development strategy for manufacturing employees
- Only two out of five (41%) completely/strongly agree their company trains people to develop the right knowledge and skills
- 38% completely/strongly agree their company provides employees with training that meets the organization's needs for today
- Only 28% completely/strongly agree their company provides employees with training that meets the organization's needs for the future

**High-impact learning organizations have a strong learning foundation, understanding that successful learning programs are continual, moving from day one through an employee's entire career. These companies tend to significantly outperform their peers in productivity, customer satisfaction, quality and other metrics.<sup>5</sup>**

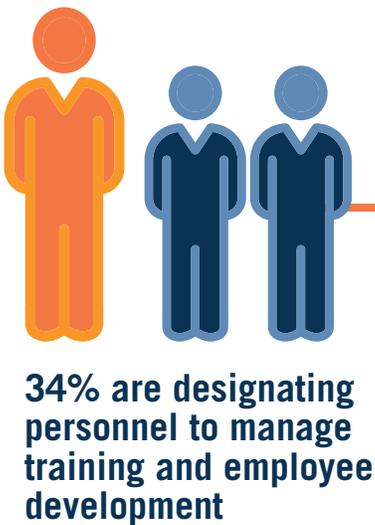
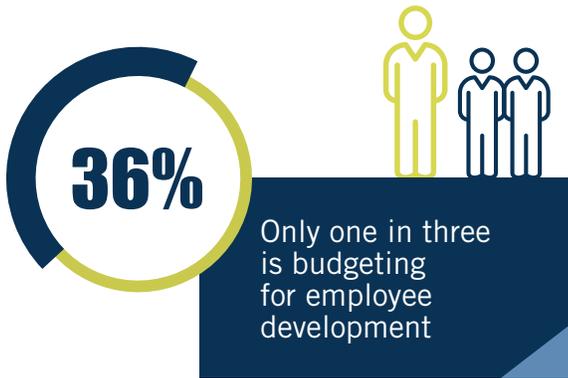
**Items within employers' control, such as making positions appealing to candidates, can be improved with:**

- Solid onboarding and job qualification programs
- Robust blended learning and development programs
- Clearly defined career pathways with skills compensation plans

INSIGHT

# BY THE NUMBERS: Take Control of the Skills Gap Crisis

**Immediate action is crucial.** For the survey, Tooling U-SME targeted leadership, human resources and training/development professionals at manufacturing companies – those with strategic insight in their organizations.

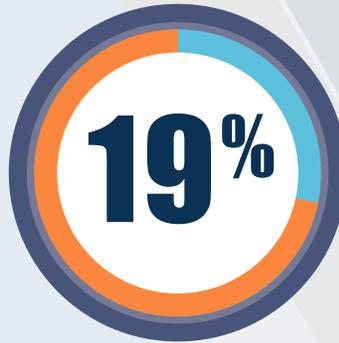


# IMPROVEMENT NEEDED

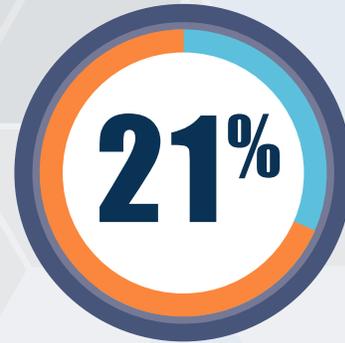
THE MAJORITY OF ACTIONS ORGANIZATIONS CAN TAKE TO DEVELOP AND RETAIN THEIR EMPLOYEES ARE WITHIN THEIR CONTROL, HOWEVER, MOST MANUFACTURERS ARE NOT FOCUSING ON THEM.



Use standardized on-the-job training to a great extent



One in five companies uses job pre-qualification assessments and performance management systems to a great extent



Fewer than a quarter of companies implemented structured onboarding of new employees to a great extent



Use a training and development program for job progression within a role to a great extent



Use skills assessments for existing employees to a great extent



Tie employee compensation to skills development to a great extent

# WANTED:

## Management Commitment and Resources

Based on comments provided by respondents in their own words, it is clear that the most common struggles for manufacturers trying to implement learning and development strategies are:

- **MANAGEMENT COMMITMENT.** This includes setting the vision for what the future workforce looks like, developing a long-term people strategy, and providing the resources needed to build a learning culture that delivers the strategy.

**Management is the key enabling force that can provide the resources needed to create, invest in, and champion a learning culture.**

- **RESOURCES.** Time, money, and people were the resources most frequently cited as reasons for limited action when it comes to attracting and retaining talent.

**TIME** — Scheduling ongoing training despite relentless production demands.

**MONEY** — Allocating funds for investment back into the workforce to keep it competitive.

**PEOPLE** — Building a strong learning culture and a workforce development team to lead a structured training program.

### INSIGHT

New training methods and approaches such as just-in-time training and microlearning — small learning bites delivered in as little as 10 minutes at a time — allow training to be delivered where and when it's needed. Some are mandating an hour per week, which could translate to as little as 10 minutes per day online, right on the shop floor.

## TRAINING BEST PRACTICES



**With a systematic approach, training best practices like these do not have to be daunting:**

**STRONG ONBOARDING PROCESS.** While “orientation” can be completed in one day, onboarding is accomplished typically in a 90-day period. It helps build a strong foundation, teaching knowledge and skills before new employees are on their own.

**FORMAL TRAINING PROGRAM.** Tribal knowledge — informal transfer of company policy and procedures by senior employees — is not an effective method of training. Successful companies create and administer standardized learning and development programs tied to competency development and career growth.

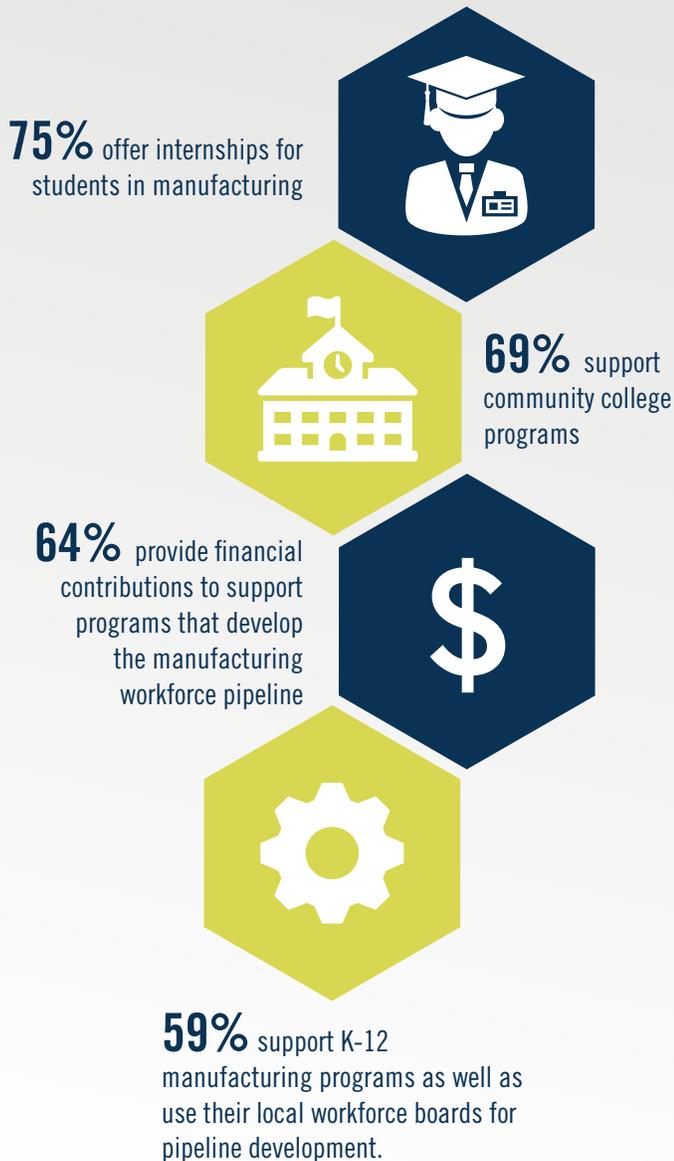
**CONTINUAL EDUCATION.** Employees want to continue learning and developing at all stages of their career, and expect manufacturers to offer them the resources to do so. Some manufacturers are partnering with educators to keep the pipeline flowing, and help retain and develop workers.

**TRAIN THE TRAINER.** Engagement studies often declare that employees’ reason for leaving is tied to unhappiness with direct supervisors. Making sure those responsible for training workers have the knowledge and skills to develop and nurture them is critical for building and maintaining a manufacturing workforce. Credentialing for trainers ensures they have a competency in delivering training in a consistent and concise manner.

**“We believe education has a positive impact on an associate’s contribution to the company, so we are focused on providing effective learning tools for continuing education.”**

— Gary Miller, director of training and occupational development, Kyocera SGS Precision Tools

# DEVELOPING THE NEXT GENERATION



**Though some of the findings in this study paint a discouraging picture, there is hope.**

Many manufacturers are realizing they must become part of the solution to attract younger generations to manufacturing, and to work within their local communities to help build the talent pipeline they will need in years to come.

Career and technical education (CTE) programs are an important piece for building the pipeline. CTE serves 94% of all high school students and 8.4 million individuals seeking postsecondary certificates and associate degrees in CTE fields<sup>6</sup>, according to the Association for Career and Technical Education. The organization says high school students involved in CTE are more engaged, graduate at higher rates, and typically go on to postsecondary education.

Working with industry, CTE programs are implementing creative ideas to sustain and grow. From simulated workplaces to internships, CTE programs teach accountability and real-life skills.

As the skills shortage continues to increase, these measures are essential for developing the next generation of manufacturing workers.

## INSIGHT

Millennials (92 million people, ages 22 to 37 in 2018) and post-millennials, or Generation Z (oldest turning 21 in 2018), represent our greatest opportunity to meet workforce needs. By understanding what motivates these new generations of manufacturing workers, companies can better build targeted training and development programs that appeal to their desire for experiences and connections.



To ensure students are prepared to work at modern manufacturing facilities, it is important for industry and education to work together to bring industry-relevant knowledge and skills to the classroom.

# STRATEGIC COMMITMENTS MANUFACTURERS ARE MAKING TO ADDRESS THE SKILLS GAP

Despite the top issues named by survey respondents, there are manufacturers that have chosen to push past the status quo to enjoy the productivity and financial benefits of a strong learning culture. Below are examples of how forward-thinking companies address top issues.

## ISSUE: Business Leadership Support — and Understanding the Value

### Solution:

**Malnove's** CEO and management team are 100% behind upgrading the company's learning and development approach, finding that engaged associates are happy, long-term and productive employees. The company is developing best practices as part of its worker qualification program, including knowledge and skills training and evaluation, and standardized OJT.

## ISSUE: Resources

### Solution:

**Pella Corp.** honed its ongoing standardized training program by putting competencies in place for defined worker performance and accountability, launching a six-week onboarding program, organizing regular Tooling U-SME Train-the-Trainer sessions to build trainers' capabilities, and aligning training with corporate strategies and key performance indicators.

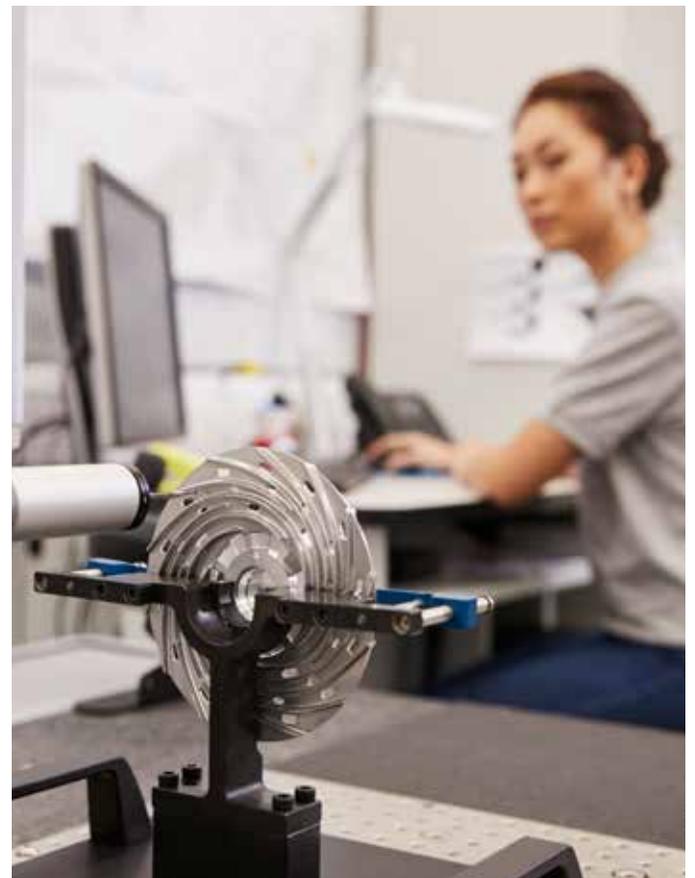
## ISSUE: Management Commitment

### Solution:

**Kyocera SGS Precision Tools'** CEO mandated 50 hours of annual training per employee.

## TOP ISSUES:

- Availability of talent
- Low budget
- Time and money
- Management commitment
- Too much production and too little time
- Resources
- Business support — value
- Need for more dedicated trainers
- Culture





## ISSUE: Culture

### Solution:

**Amsted Industries** acknowledged that a learning culture is critical to remain an industry leader, and that training — in person and online — plays an important role. Other steps include creating a skills verification system, aligning skills to job roles, strengthening onboarding with a core curriculum for new hires, and creating transparent career pathways so workers know how to get to the next level.

## ISSUE: Building the Pipeline — Online Training

### Solution:

**SME Education Foundation's** Partnership Response in Manufacturing Education (PRIME®) focuses on closing the skills gap by establishing centers of excellence in manufacturing education. This partnership brought together Anna (Ohio) High School and **Honda of America Mfg., Inc.** Honda's Anna Engine Plant created a training program with Tooling U-SME, and PRIME® brought the same training to Anna High so that students have a solid foundation for future employment.

## ISSUE: Funding

### Solution:

**Arwood Machine Corp.** and Tooling U-SME, working with Commonwealth Corp., applied for and secured a general program grant from the Workforce Training Fund Program in the State of Massachusetts. Many small- to medium-size manufacturers think they may not be able to afford an in-house training program, but as Arwood discovered, state and national grants can make it a reality.

## ISSUE: Building the Pipeline — High School Internships

### Solution:

A PRIME® lab was implemented in Michigan's Grand Haven High School, providing an internship program with local manufacturer **Shape Corp.** Juniors and seniors work full-time in the summer and part-time during the school year. Students partner with mentors in one of four apprenticeship programs: machine repair, tool and die, electrician, and roll form. Upon graduation, they are fast-tracked into the company's apprenticeship programs.



# CONCLUSION:

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- ✓ The skills and talent crisis is here to stay, and maintaining the status quo for employee training and development is no longer an option.
- ✓ While some manufacturers are making progress, the industry still has a long way to go in addressing the skills gap through innovative approaches to training new and incumbent workforce; adoption of exciting, new learning technologies; and engaging with the local community for pipeline development.
- ✓ Employees are the secret weapon of manufacturers determined to beat the competition. They solve problems, create new ideas, and cause innovation to happen. Employers are realizing that investing in their workforce is critical for long-term success.
- ✓ For best results, companies must embrace a full life cycle of training. As world-class manufacturers know, an ongoing standardized learning and development program that is methodical, visible and tied to the bottom line will provide manufacturers with a competitive advantage for years to come.



## PROFILE OF RESPONDENTS

To gain significant insights, the goal of the report was to engage those in the manufacturing industry who would have access to information about strategic company challenges, volume and cost of turnover, and a deep understanding of training and hiring needs.



Nearly

**40%**

of respondents were in Human Resources and Talent/Training and Development



Nearly

**34%**

were in leadership and management positions

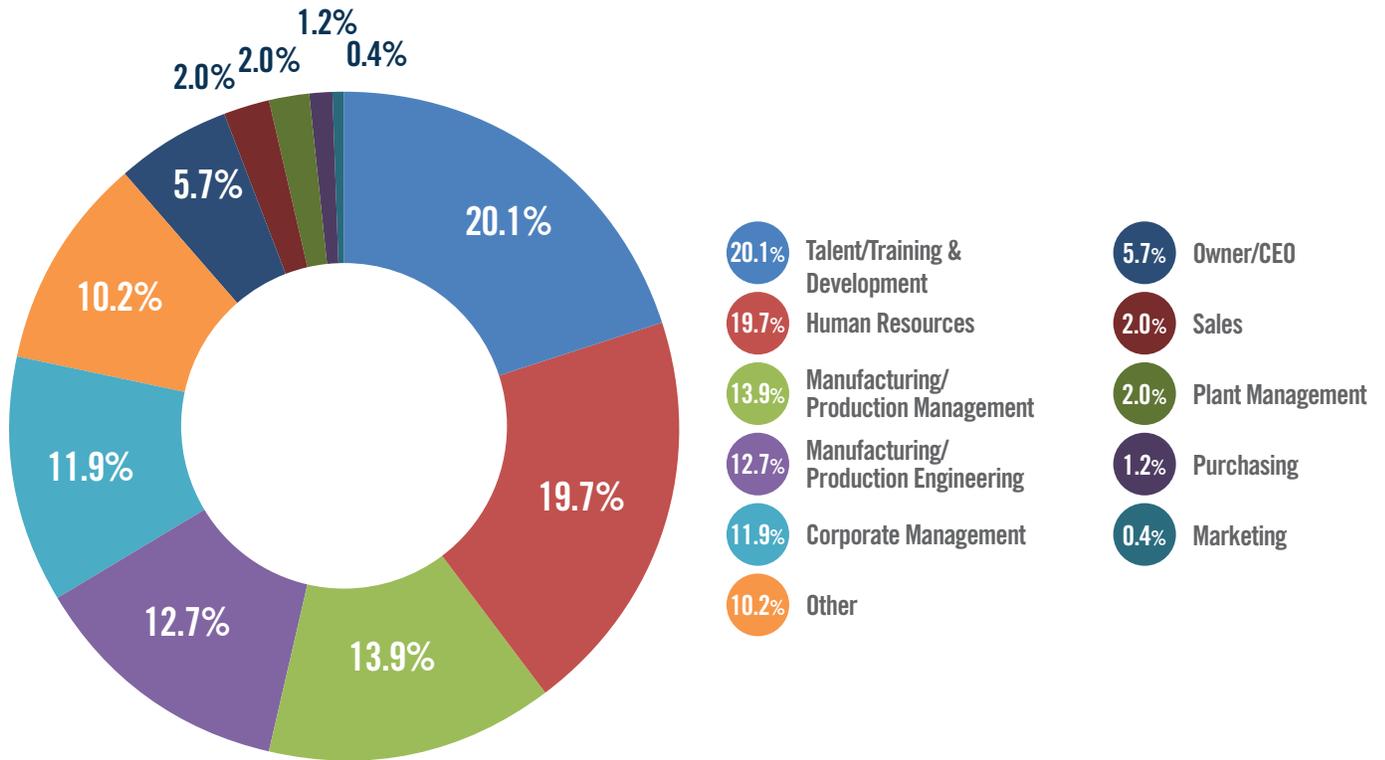


In the “other” category

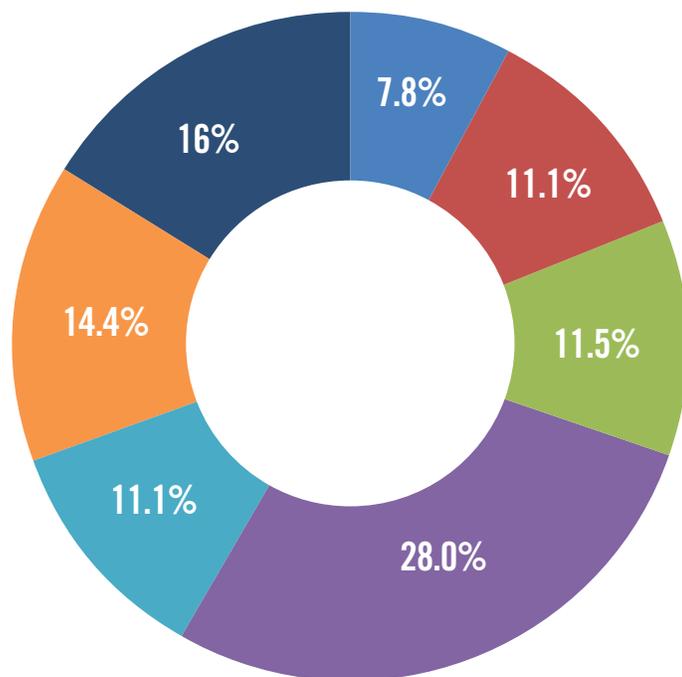
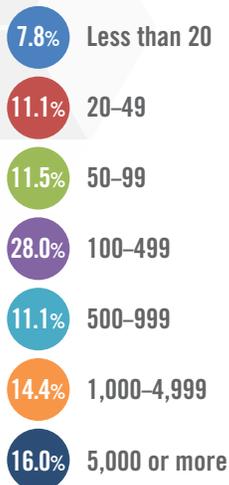
**40%**

of the functions were in Quality

## Job Titles/Functions

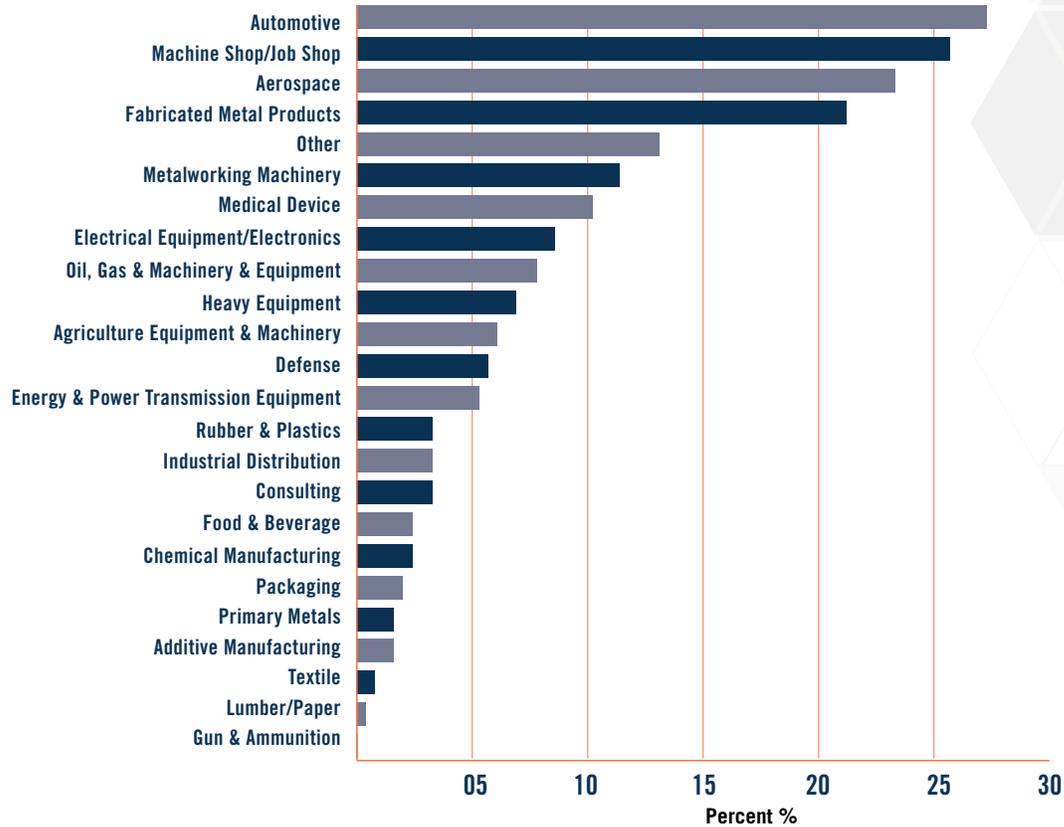


## Number of Employees in Organization



# INDUSTRIES

Respondents represented a wide range of industries; they were asked to provide up to three industries in which they operated.



## In Their Own Words

Even manufacturers who see the value of developing their workforce often struggle with how to implement change. But building high performers doesn't need to be complicated. In the coming year, based on our extensive interaction with manufacturers across the country, we'll share proven action steps that can boost employee productivity and morale, despite heavy production and operational demands. By implementing training and development programs tied to the bottom line, your company will soon outpace the competition.

*"Availability of talent"*

*"Low budget"*

*"Time and money"*

*"Management commitment"*

*"Too much production and too little time"*

*"Resources"*

*"Business support — understanding the value"*

*"Need for more dedicated trainers"*

*"Culture"*

# THE TIME TO ACT IS NOW.

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THE DISCOURAGING RESULTS REINFORCE THAT  
THE BARRIER TO ADDRESSING THE SKILLS GAP  
IS THE STATUS QUO.



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**“The economy appears poised to expand this year at the fastest clip since the recession ended in 2009.”**

– *The Wall Street Journal*, July 18, 2018

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## IS YOUR COMPANY READY?

The growth is great news for the U.S. manufacturing industry. However, with the lowest unemployment rate in years, companies face a major hurdle when it comes to hiring the people they need to meet the demands.

Yet, as this Tooling U-SME Industry Pulse: 2018 Manufacturing Workforce Report shows, little has changed in the industry since the dangers of retirements, a decreased talent pipeline, and the new skills needed for advanced technologies first became front-page news.

### **The Tooling U-SME Industry Pulse:**

2018 Manufacturing Workforce Report provides insights as well as proven action steps for addressing top priorities that will propel companies toward productivity and profitability such as finding skilled new hires, upskilling the incumbent workforce, and retaining employees.

<sup>1</sup> “The Skills Gap in US Manufacturing: 2015 and Beyond,” Deloitte and The Manufacturing Institute, 2015.

<sup>2</sup> Morath, Eric. “Job-Skills Gap May Curb Growth Report Warns,” *The Wall Street Journal*, July 18, 2018, A4.

<sup>3</sup> “Manufacturing in the New Industry 4.0 Era Survey,” SME, 2018.

<sup>4</sup> 5 Best Practices for Building a High-Performance Workforce, Tooling U-SME.

<sup>5</sup> “High-Impact Learning Culture: The 40 Best Practices for Creating an Empowered Enterprise,” Bersin & Associates, June 10, 2010.

<sup>6</sup> “CTE Today,” Association for Career and Technical Education, January 2018.



Tooling U-SME delivers versatile, competency-based learning and development solutions to the manufacturing community, working with thousands of companies including more than half of all Fortune 500® manufacturers, as well as 600 educational institutions across the country. Tooling U-SME partners with customers to build high performers who help their companies drive quality, profitability, productivity, innovation and employee satisfaction. Working directly with hundreds of high schools, community and technical colleges, and universities, Tooling U-SME is able to help prepare the next-generation workforce by providing industry-driven curriculum.

A division of SME, a nonprofit that connects all those who are passionate about making things that improve our world, Tooling U-SME can be found at [toolingu.com](http://toolingu.com) or on Facebook ([facebook.com/toolingu](https://facebook.com/toolingu)) and Twitter ([twitter.com/toolingu](https://twitter.com/toolingu)).



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