

# GIVING MANUFACTURING CAREER PATHWAYS A LIFT

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# **ABSTRACT**

Rapid technological changes, an increasingly global economy, and employment's changing nature require a workforce that is not only trained prior to embarking upon a career, but that also remains current through lifelong learning. Advanced manufacturing is one of many industries in the U.S. in which employers face challenges finding sufficient workers with necessary skills. This case study explores the way the Industrial Manufacturing Technician apprenticeship supports workers and companies' needs, focusing on three factors:

(1) harnessing the apprenticeship's potential; (2) implementing it, and (3) future options. Six months after the Labor Institute for Training helped Benteler launch its IMT program, employee turnover dropped from 33 to 11 percent. Additionally, the IMT includes inclusive strategies while creating access to wages averaging \$24 per hour. The case study shows developing accessible and equitable apprenticeships for culturally diverse and underserved populations offers a solution to employers and unemployed individuals.

*Keywords*: apprenticeship, career pathways, equity, IMT, manufacturing, registered apprenticeship, training

# EVOLVING ECONOMIES NEED AN EVOLVING WORKFORCE

Workers can no longer complete their education and training prior to starting their careers. Instead, increasingly rapid changes in technology and automation (Frey & Osborne, 2013; Executive Office of the President of the United States, 2016) in an increasingly global economy (Dadush & Shaw, 2012), along with the changing nature of employment (Manyika, Lund, Bughin, Robinson, Mischke, & Mahajan, 2016), are creating an economy that requires workers to remain current through lifelong learning. Training programs, such as apprenticeships that combine on-the-job learning (OJL) with academic instruction, allow workers to upskill without having to step out of the workforce. Moreover, apprenticeships allow employers to customize programs to meet their most pressing talent needs.

This case study explores how Registered Apprenticeship programs support the needs of workers and companies in advanced manufacturing. Recent reports from the Board of Governors of the Federal Reserve System (Tito, 2018) describe a manufacturing sector that is grappling with labor shortages, particularly for skilled and available talent. This industry reflects a larger pattern currently in the U.S. economy, in which a tight labor market is causing employers to compete to recruit workers to meet their growing demand. Workers who can apply specialized skills to the production line are particularly difficult to find. Apprenticeship programs allow companies to grow their own talent while also empowering workers to succeed in their careers.

LIFT<sup>1</sup> in Indiana has partnered with several employers, including Benteler Automotive Corporation, to deliver the Industrial Manufacturing Technician (IMT) Registered Apprenticeship program to entry-level production workers. As a labor management organization, LIFT has adopted a worker-centered approach with its partners, which has led to diversity and advancement outcomes that stand out in the manufacturing industry. This case study explores how the IMT apprenticeship program fits into a broader career pathway and advancement strategy for workers, and how program design and implementation can ensure that equity is built into the program.

# Harnessing the Potential of Apprenticeship

Registered Apprenticeship is an apprenticeship program that is approved by the U.S. Department of Labor's Office of Apprenticeship or by a state apprenticeship agency. These programs last from one to six years and are sponsored by employers, labor management organizations, or other intermediary organizations. In addition to paid, OJL, and formal classroom instruction common across all apprenticeships, these programs meet several quality requirements, including providing at least approximately 2,000 hours of OJL and 144 hours of

related instruction (U.S. Department of Labor, 2018). Registered apprentices receive on-the-job supervision and mentorship, earn progressively increasing wages, and obtain an industry-recognized credential (see Figure 1.1).

Figure 1.1



In the United States, Registered Apprenticeship has traditionally served as a workforce strategy in the building trades, which represent two-thirds of the country's apprentices (Collins, 2018). The appeal of apprenticeship is catching on, and more industries, including manufacturing, are signing on to Registered Apprenticeship. Evidence in Germany, Switzerland, and the United Kingdom demonstrates that apprenticeship can be valuable across these new industries.<sup>2</sup>

Registered Apprenticeship is very popular among companies who try it—i.e., 86 percent would "strongly recommend" it to others (Lerman, 2014). Utilizing such a program provides great benefits to workers. Unlike many workforce development strategies that focus on preparation for a job, the in-depth design of Registered Apprenticeship allows the program to serve as a built-in career pathway helping workers enter a job and advance through it to a more skilled occupation. The benefit of Registered Apprenticeship to workers is clear: the average apprentice

earns \$300,000 more than the average American worker over the course of his or her career (U.S. Department of Labor, 2018b).

While Registered Apprenticeship can offer many career benefits, it is not an equally accessible and effective pathway for the whole population (Toglia, 2017). Women have long been underrepresented in Registered Apprenticeship. The share of program completers who are women has increased from 6.2 percent in 2008 to 7.3 percent in 2017, but that in part reflects the growth of apprenticeship in occupations that have been more traditionally female. The participation of people of color in Registered Apprenticeship more closely matches their share of the U.S. population but, like women, they are more likely to be in programs that pay less. In 2017, women and people of color earned an average wage upon exiting apprenticeship of \$11.49 and \$14.35, respectively, as compared with \$26.10 overall (Hanks, McGrew, and Zessoules, 2018).

This trend is confounded in industries that have a low representation of women and people of color. Manufacturing is one such industry, with an employment rate of only 29.5 percent women and 20.1 percent people of color (U.S. Department of Labor, 2017). As in the Registered Apprenticeship system, these populations are more likely to be employed in entry-level jobs. Yet these demographics account for about two-thirds of the U.S. population. Overlooking them can hurt a company looking to identify or develop new talent. Moreover, a more diverse workforce can help a company's bottom line (Badal, 2014; Hunt, Leyton, & Prince, 2015). Registered Apprenticeship programs that build an equity lens into their design and delivery can benefit a diverse range of workers and the companies they work for.

# **Next-Generation Manufacturing Career Paths and Ladders**

Apprenticeship career pathways are a powerful approach to addressing the talent gap in the advanced manufacturing industry. They provide a coherent sequence of rigorous academic and career courses that can begin in high school and lead to an associate's degree, a bachelor's degree, and beyond—and/or an industry-recognized certificate or license. As an academic approach, apprenticeship incorporates many of the most advanced learning theories, such as contextualized, applied, and project-based learning. It develops learner competencies and provides hands-on skill development (Hay & Barab, 2001). Apprenticeship programs can lay the foundation for building careers, acquiring workplace learning experiences, and attaining credentials that can be combined to contribute to a postsecondary degree. By including career and technical programs in high schools, apprenticeship programs can also work in conjunction with the K–12 educational system. The foundation of the apprenticeship model is one of continuous skill building to achieve higher levels of employment in an occupation or industry (Lerman, 2012; Lerman, 2009).

### THE IMT APPRENTICESHIP PROGRAM

The IMT apprenticeship is a nationally recognized apprenticeship that is a basis for multiple career pathways within the advanced manufacturing sector and is easily tailored for different manufacturing environments, different-sized companies, and different types of manufacturing schedules. The purpose of the IMT apprenticeship is to build the skills and competencies of workers in manufacturing production positions, and to prepare those workers to participate in and complete apprenticeships for more advanced and highly skilled manufacturing occupations.<sup>4</sup>

The IMT program follows a hybrid training approach that integrates time-based learning and competency-based training providing 3,000 hours of structured technical instruction, comprised of 2,736 hours of OJL from experienced mentors assigned by the employer, and 264 hours of related technical instruction courses that span manufacturing technology systems and processes, industrial communications, industrial math, industrial blueprint reading, and safety. One-hundred and ninety-two hours of the related instruction includes four modules of the Manufacturing Skill Standards Council (MSSC) Certified Production Technician curriculum. Each of these modules includes an exam that, once completed, earns an apprentice a Certified Production technician (CPT) certificate, which is nationally recognized. The instruction also includes courses on interpersonal skills, lean manufacturing, and practical problem solving. The additional hours of related technical instruction can be customized to meet each company's specific technical needs.

Additionally, OJL in the IMT apprenticeship utilizes the supervision of a training mentor, as IMT apprentices are assigned tasks that build their skills and competencies in the full range of the production cycle within their company. Supervisors are guided by a detailed manual, also called a job book, that outlines the competencies required for different types of key skills, and that can be tailored by firms to meet their specific needs and systems (see Table 1.1). For instance, the IMT program trains production workers in settings as diverse as aerospace, foundries, transportation equipment manufacturing, and plastics fabrication, and each job book is customized to the employer's needs.

Table 1.1. IMT Job Book: Major Competencies

Workplace Safety	Produce Quality Product
Interpret Product Specifications	Routine Equipment Maintenance
Set Up, Inspect, and Adjust Production Equipment	Inventory and Material Processes
Operate Production Equipment	Continuous Improvement Processes
Measure and Inspect Work	Trends and Current State of the Business

Source: Wisconsin Regional Training Partnership, Industrial Manufacturing Technician:
Apprenticeship Training Guidelines

#### LIFT and the IMT

Established more than 25 years ago, LIFT is an Indiana-based workforce intermediary that works with employers and organized labor to develop workforce-readiness programs for the unemployed and underemployed, and it has expanded worker-centered sustainable workforce development program strategies that include apprenticeship and career pathway development. In 2015, LIFT began its partnership with JFF and is overseeing implementation and expansion of the IMT apprenticeship in Indiana, Kentucky, and Ohio. By 2020, the project will register a minimum of 250 new IMT apprentices resulting in at least 125 journey workers over 5 years. LIFT brings experience in outreach, recruitment, and advocacy on behalf of employed, unemployed, and underemployed individuals. Within 2 years of this initiative, LIFT developed IMT apprenticeship programs for nearly 200 apprentices with seven employer sponsors, including the Benteler Automotive Corporation. 6

#### How the IMT Works at Benteler

Benteler is a large German-owned manufacturer with 30,000 employees at 83 locations in 40 countries offering vocational education at 15 of its automotive, steel/tube, and distribution locations in Germany. Benteler's culture of learning has expanded to its facilities in Indiana, Michigan, and South Carolina. Currently, 750 young people are being trained in the company in different apprenticeships and career-development opportunities, including 82 apprentices in Indiana and Michigan. The focus of Benteler's vocational education is on technical occupations such as industrial mechanic or production technologist. Additionally, apprenticeship completers

at Benteler become mentors for the next cohort of apprentices—which gives apprentices responsibilities and appreciation for the work from an early stage. By acting as mentors, the apprentices consolidate their knowledge in a core area, gain a better grasp of company processes, enter discussions that transcend the boundaries of individual disciplines, and feel valued because of the responsibilities they are assigned (BMWi, 2017).

Benteler considers training and development opportunities for its employees to be critical for their success. As advanced manufacturing technology continues to transform manufacturing skill needs, Benteler proactively maintains a learning academy for employees to expand their expertise and develop new competencies. The IMT complements the simultaneously launched Benteler Academy, which allows employees to take courses during their work hours and earn an associate's degree in two years, achieving full certification in another three. Benteler is using the IMT apprenticeship as a recruitment tool for new hires and supervisors, thus making knowledge an implicit part of its manufacturing practice, for workers as well as management.

Each of Benteler's locations has taken a different approach to identifying its IMT apprentices. In some locations, supervisors identified high-performers, others posted the opportunity as an advancement strategy, and another selected recent college graduates lacking experience. At the Goshen, Indiana plant, enrollment in the IMT apprenticeship is mandatory. This selection process promotes ethnic, racial, and gender diversity in training and advancement. Apprentices are assigned to a supervisor responsible for overseeing their learning, but many workers contribute to the instruction. OJL is provided by peers, with more experienced operators providing training on required competencies as they arise in the production process. Apprentices are required to do the majority of the related instruction on their own time and at their own pace through online courses. However, apprentices are also paid overtime for weekly two-hour classes that are scheduled just before or after each shift to minimize disruption to the production line. This in-person instruction supports completion because apprentices have an easy way to ask questions that emerge in their online work. The instructor can then connect the instruction to how Benteler applies the concepts in practice, identify struggling students and assist in remediation, and help prepare apprentices for the four required exams.

While experienced workers have completed the IMT in as little as 3 to 4 months, relatively new employees generally take 12 to 20 months. The timing is largely dependent on the self-pacing and engagement of the apprentice. Benteler allows each plant to determine how the completion of the IMT leads to advancement. At the Goshen plant, the IMT graduates are in a pool of candidates that would be given preference for job openings, career advancement, or additional technical training or apprenticeships because they completed the IMT program. Sites that preselect candidates advance IMT journey workers to a more skilled position, such as from production operator to setter. Other plants are approaching the journey workers as a talent pool that is eligible to apply to the skilled positions.

## **Measuring Impact**

The IMT is meeting the needs of workers and companies at the plant, regional, and national levels. Benteler has already begun to see dividends for these investments, even in an increasingly tight economy with high demand for, and turnover among, a limited pool of production workers. Six months after its launch of the IMT program and Academy, turnover dropped from 33 percent to 11 percent. In addition, Benteler now only posts regularly for open operator positions. The remaining, higher-skill positions are now created within Benteler using these training strategies.

Through their broader pilot of the IMT, LIFT and its partner employers have created a successful advancement strategy for a range of lower-skilled workers. Forty-five percent of the incumbent workers who became apprentices had only a high school diploma or lower. The pilot also supported advances for women in the industry: 26 percent are women, nearly equal to the national average share of women in the industry (Laughlin & Christnacht, 2017). LIFT's strategies are not only inclusive but also successful in creating access to high wages. Building on this success, LIFT, Benteler, and a range of employers and educators have formed the Advanced Manufacturing Sector Partnership of Elkhart County, Indiana. The partnership is supported by the Horizon Education Alliance, an Elkhart County nonprofit organization focused on community collaboration that leads to educational attainment and economic vitality, and plans to train 650 to 800 apprentices across about a dozen companies over the next two years.

LIFT's experiences in Indiana reflect those of other intermediaries and employers using the IMT apprenticeship elsewhere in the country, who have had broader success in diversifying manufacturing. Collectively, these intermediary partners have registered 850 IMT apprenticeships and 22 percent are people of color (JFF, 2018). The average apprentice earned \$17 per hour before the program and \$24 per hour after completion of the IMT apprenticeship. The IMT program was co-developed and launched by the Wisconsin Regional Training Partnership, and has spread to other states in partnership with the national intermediary, JFF, and several regional intermediaries. Employers and workforce providers in Washington, California, New York, and other states are working to establish IMT programs specifically because of their success in career advancement for a diverse workforce.

# NEW ERA FOR OPPORTUNITY: FUTURE DIRECTIONS

A survey (Lermann, Eyster, & Chambers, 2009) of 1,000 U.S. apprenticeship sponsors found that developing apprenticeship programs facilitates employers' ability to employ and retain skilled workers with talents customized to their specific needs. While an apprenticeship program can assist employers facing labor shortages, a training program that targets underrepresented workers including women and people of color can greatly increase the pool of skilled workers. The labor shortage can be even more effectively addressed by apprenticeship programs that focus on the 63 percent of the adult population without a four-year college degree (U.S. Census, 2017), including African Americans and Hispanics age 25 and older, as well as nearly 6 million young adults between 16 and 24 who are not in school or working (PBS, 2013).

LIFT, recognizing the importance of diversity in apprenticeship, developed a new training program to provide access for Limited English Proficient, Spanish-speaking workers in entrylevel production jobs called Growing Opportunities in America for Latinos! (GOAL!). The program combines English language instruction for people with Limited English Proficiency with a Spanish version of MSSC's CPT training to establish manufacturing career pathways and advance the skills of Indiana's workers that have limited English proficiency. Moreover, individuals that earn the CPT program through this initiative receive six credits as a student at Ivy Tech Community College. LIFT and its service providers are recruiting students from English language learner classes at local colleges, including Goshen College near Benteler, attracting new workers to manufacturing. Partner companies are offering guaranteed job interviews, a signing bonus, or higher base pay to those who earn the CPT. Individuals who are hired by IMT sponsors will have already completed most of the related instruction for the apprenticeship, so they will only need to complete the OJL portion. One hundred percent of GOAL's current enrollees are Latino, and nearly 26 percent are women. Additionally, 40 percent are young adults ages 17 through 29, and 45 percent held a secondary school diploma at the time of participation (JFF, 2018).

There is consensus among policymakers that labor shortages in manufacturing exist and, while there have been attempts to improve access to apprenticeships in recent years, more can be done. Developing apprenticeship career pathways that are more accessible and equitable for culturally diverse and underserved populations offers a solution for employers and unemployed individuals. These pathways need to begin with inclusive strategies to attract workers to the industry and more seamlessly offer opportunities for additional training that is tied to advancement. Employers, academia, and government at all levels need to recognize that they have a role to play in addressing these workforce challenges through policy, research, and inclusive program development.

# **ENDNOTES**

<sup>1</sup> Labor Institute for Training (LIFT) is an Indiana-based workforce intermediary that works with employers and organized labor to develop workforce-readiness programs for the unemployed and underemployed, and it has expanded worker-centered sustainable workforce development program strategies that include apprenticeship and career pathway development.

<sup>&</sup>lt;sup>2</sup> For example, Samuel Muehlemann and Stefan Wolter (2014) finds that even across industries the return on investment in these countries is positive.

<sup>&</sup>lt;sup>3</sup> See, for example, the trend for black and Latino workers in production-level jobs in the Chicago manufacturing industry, leading to annual average wages of \$4,763 and \$3,963, respectively, as compared with \$8,750 for white manufacturing workers in the region (Córdova, Wilson, & Stettner, 2018).

<sup>&</sup>lt;sup>4</sup> For ideas on how the IMT and other Registered Apprenticeships can be designed to create a more direct advancement pathway, see Deborah Kobes (2018).

<sup>&</sup>lt;sup>5</sup> As part of the national American Apprenticeship Initiative grant, JFF, a national nonprofit that helps low-skilled youth and adults advance to family-sustaining careers while enabling employers to build and sustain a productive workforce, received funding to implement a five-year, \$5,000,000 grant to expand the IMT Registered Apprenticeship in 16 regions of the United States. JFF, along with several workforce intermediaries, including LIFT, has partnered to expand this apprenticeship for new and incumbent front-line production workers to increase the number of qualified individuals who enter middle- and high-skill occupations within the manufacturing sector.

<sup>&</sup>lt;sup>6</sup> The other employer sponsors include Amatrol, Lippert Components, Stant, TG Missouri, and Dayton-Phoenix Group, Inc.

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