INDUSTRY & INCLUSION

MANUFACTURING WORKFORCE STRATEGIES BUILDING AN INCLUSIVE FUTURE

How community-embedded workforce organizations center racial equity, credentialing, and training to create stronger neighborhoods

June 2021

Urban Manufacturing Alliance

THE CENTURY FOUNDATION

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INTRODUCTION

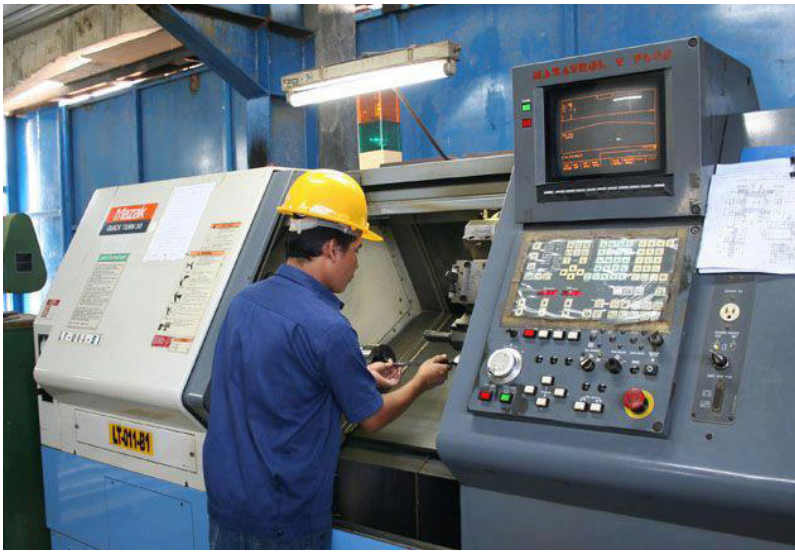
Overview

In 2020, The Century Foundation (TCF) and the Urban Manufacturing Alliance (UMA) collaborated to create a national program to examine educational strategies and community-driven workforce models that connect diverse communities to opportunities in manufacturing, and to identify the policy change needed to scale those efforts. The Inclusion and Industry 4.0 (I&I) Project brought together leading practitioner organizations to understand and lift up best practices and challenges, and extract lessons for policymakers to expand support for community-based manufacturing training. I&I represents a critical component of TCF and UMA's goal to promote the development of effective workforce and education strategies targeting an inclusive future in manufacturing.

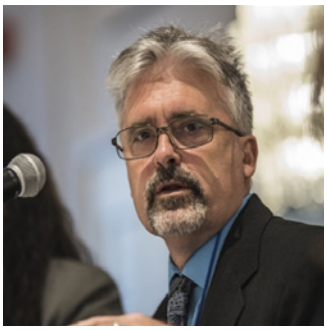
The I&I program builds on an earlier collaboration starting in 2017 when UMA joined TCF on their **High Wage America campaign**, which published nine policy research reports and held conversations with hundreds of stakeholders across the industrial Midwest. The initiative, one of a new generation of high impact TCF policy research efforts to address inequality, attracted multiple 2020 presidential contenders (Senators Sherrod Brown and Kirsten Gillibrand, and now-President Joe Biden) to its events, and national media attention for its recommendations. High Wage America research concluded that tackling inclusion, alongside a move to more advanced production, would determine the fate of American manufacturing.

Manufacturing has one of the most aged workforces in the economy and currently faces a recruitment and skill-building challenge. These come on top of the fourth industrial revolution as manufacturers are redesigning production and products to take advantage of automation, artificial intelligence, and the internet of things — demanding new skills at every level of production. To address these challenges, manufacturing companies and workforce development partners are developing new approaches to adult skill development that takes into account barriers to accessing, committing to, and completing long-term training programs. These same organizations are also going through their own learning and growing in order to better support Generation Z talent — individuals born between 1997 and 2012 — who as students experienced drastic economic, cultural, and technological shifts which have impacted K-12 learning, personal values, and ideas about meaningful, sustainable work.

Luckily, an exciting generation of workforce intermediaries is providing diverse workers new opportunities to attain skills in advanced manufacturing. These intermediaries served as our I&I cohort members, and focus on serving adults and adolescents, primarily those of color. Despite the loss of manufacturing in all of our cohort cities, these communities have long counted on the many remaining manufacturing jobs as a source of middle-class income, especially for those workers who don't have a college degree. But a generation of



Industry & Inclusion 4.0 Cohort Members



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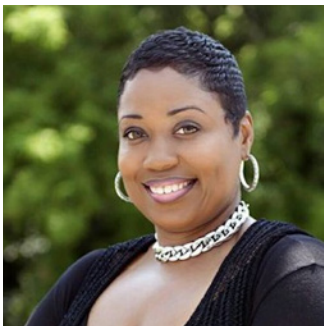

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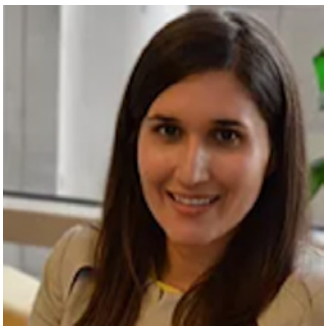

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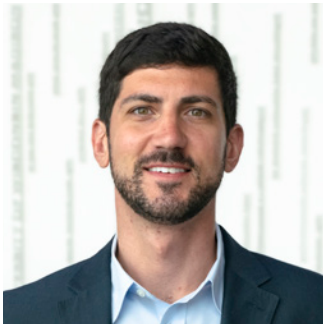

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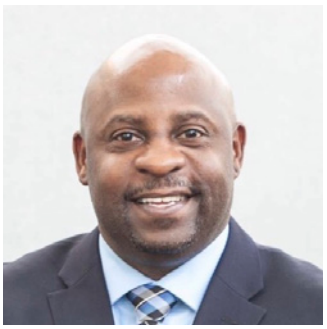

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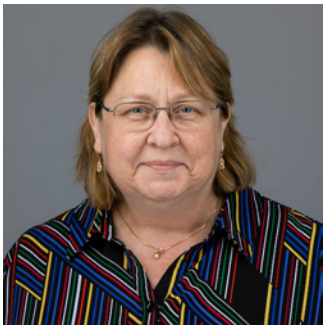

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parents who experienced job loss from that industrial decline — particularly in urban communities of color — have served as a cautionary tale for current youth and young adults. As a result, many younger workers and their families today do not view manufacturing jobs as a viable pathway, and thus have not encouraged them to develop the skills needed to enter and advance in manufacturing careers. However, the rebound in manufacturing over the past eight years, means that good-paying jobs in manufacturing could once again make a big difference for urban communities of color, and others who need well-paying work — but only if comprehensive programs are in place to make the connections between communities, training programs, and these good jobs.

The innovative leaders of the eight I&I cohort members prove that with the right program models in place, a variety of un- and under-employed adults of all ages are able obtain the necessary skills to gain employment into a rewarding career in manufacturing, with further opportunities for skills advancement and wage progression. Through 2020, cohort members, TCF, and UMA worked collaboratively through virtual roundtable discussions, seminars, and interviews to explore policies and programs, questions of scale and sustainability, and promising practices. From this work many takeaway lessons about education, training models, employer engagement, and supportive service strategies were organized, documented, and shared.[1] Moreover, this collective research will position these organizations as national leaders who can spark replication in other communities, and provide policymakers with a road map of how to make such replication and expansion possible.

How to use the research

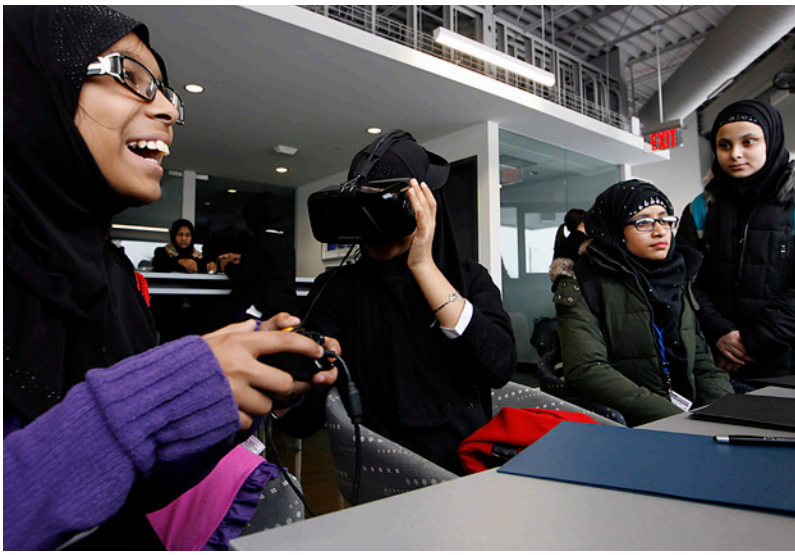
TCF and UMA have packaged lessons learned from the Industry and Inclusion 4.0 Project into two publications: *Industry & Inclusion: Manufacturing workforce strategies building an inclusive future*, and *Industry & Inclusion: A Blueprint for Action*, this research report and blueprint for action. This report is a journalistic set of profiles of our cohort organizations and the people who power them. *Industry & Inclusion: A Blueprint for Action* is a set of conclusions and insights based on the common themes of: Learning, Racial Equity, Economic Justice, Pathways to Ownership, Relational Innovations, and Creating Strong Partnerships. These publications highlight barriers and opportunities at the intersection of workforce and economic development, place a spotlight on leading members of the cohort, document learnings from the cohort's interactions, and organize research and public policy recommendations.

The scaling of successful workforce programs like those highlighted in these publications will be aided by complementary public policies. TCF, UMA, and the I&I cohort are promoting a greater priority on inclusion throughout federal manufacturing programs, such as Manufacturing USA and the Manufacturing Extension Partnership, and national workforce development programs, such as the Workforce Innovation and Opportunity Act (WIOA). TCF's *Industry & Inclusion: A Blueprint for Action* includes an analysis of ways in which federal workforce and higher education policies can be reformed to facilitate the scaling of I&I cohort members and similar program models. In addition,

1 See Appendices.

Industry & Inclusion: A Blueprint for Action includes state and regional action areas, including how to invest federal and state dollars and how to structure higher education involvement in non-degree credential programs in manufacturing.

This report includes a summary of the interactions and discussions between cohort members, UMA, and TCF; reflections on connections within those discussions; and a collection of technical descriptions and personal profiles that share the stories and backgrounds of program leaders and stakeholders with whom they work. *Industry & Inclusion: Manufacturing workforce strategies building an inclusive future* will help similar workforce development organizations gain insights to improve upon existing practices and provide guidance and connections to help make the leap to new beneficial practices. Together, *Industry & Inclusion: Manufacturing workforce strategies building an inclusive future* and *Industry & Inclusion: A Blueprint for Action* are meant to be used by many different stakeholders who are advocating for new, continued, or expanded support for community-embedded, innovative workforce development organizations that are training current and future manufacturing talent.



SUMMARY OF METHODOLOGY

The goal of the I&I program was to create an opportunity for program leaders to tell the story of their work from their perspective, create a space to discuss what is and isn't working in current strategies, and identify challenges and discuss solutions to increase impact. To achieve this, TCF and UMA organized a new cohort of urban, community-based organizations that have built workforce development programs to help create new education and career pathways for women, communities of color, people with conviction histories, veterans, and other marginalized communities. TCF and UMA's original research plan for the cohort included in-person discussions, facility visits, and national gatherings. Due to the COVID-19 pandemic all activities shifted to virtual gatherings and discussions. The pandemic provided an unexpected backdrop that amplified the importance of the project. Yet, the economic shutdown due to social distancing guidelines, combined with a spike in demand for personal protection equipment and the shutdown of global supply chains, increased awareness of the importance of local factories as places where both essential products are made and where frontline workers work. Also during the I&I cohort, police officers in three different cities murdered George Floyd, Breonna Taylor, and Rayshard Brooks — three Black people, three among far too many before and after them — further amplifying the importance of taking action to include racial equity and inclusion in economic development and workforce strategies. While it is hard to fully grasp how collective learning may have been impacted by these historic moments, it is important to acknowledge they created an immediate shared learning experience that brought participants together in unanticipated ways.

How the project was done

TCF and UMA reorganized our original learning program into all online interactions between cohort members, project conveners, an advisory board, and other

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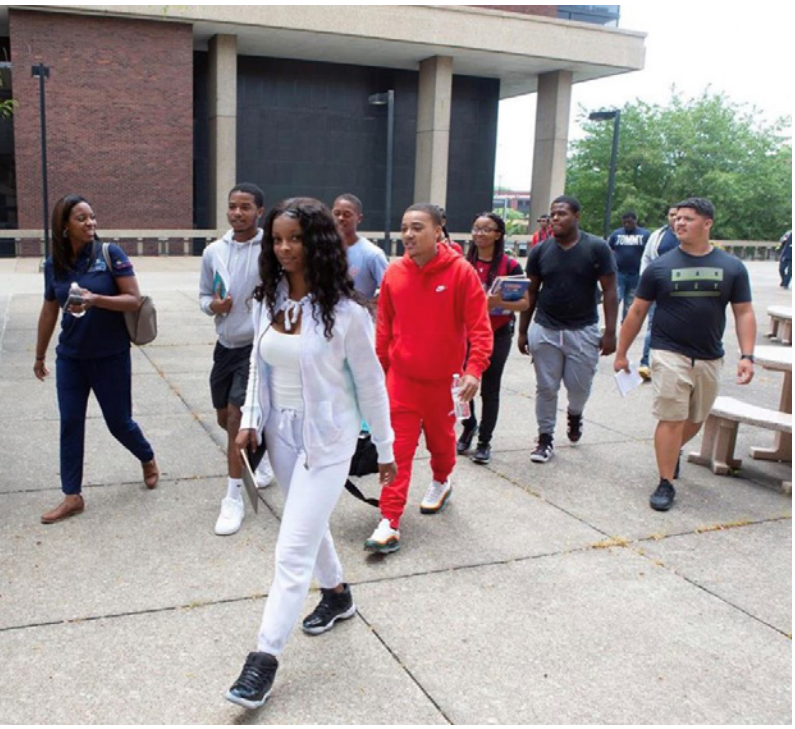
national experts. The research team used contemporary approaches to knowledge transfer to identify the impactful ways these eight models have been able to seed and scale programs in their own communities while strengthening local manufacturing ecosystems.

The research methods implemented over the course of the 12-month program include: roundtable discussions between all cohort organization stakeholders (industry leaders, trainees, education partners); webinars featuring cohort members, advisors, and subject matter experts; and one-on-one interviews with program leaders and stakeholders from their region. Qualitative analysis was done of these discussions to connect themes across conversations, cities, and programs. Through analysis of the findings, we extracted lessons from the field and identified barriers to success. We designed research questions in each of the structured discussions to capture the strategy behind how cohort members work



with communities and businesses to create career pathways for workers, particularly in communities of color and low-income populations, who currently are not well-connected to the manufacturing sector.

Within the larger conversation about workforce development and ecosystem engagement, we asked questions dedicated to more focused elements, such as the effects of different credentialing models — such as apprenticeships, higher education programs, or competency-based credentials — and relationships with educational institutions on program design and outcomes. We included other questions to better understand the continuing impact of Industry 4.0 technologies, such as automation, cybersecurity, and the internet of things, on the requirements in the manufacturing workforce, and how these are changing the skills required for manufacturing jobs. Within each discussion we intentionally left time and space open to allow more organic sharing and reflection.

While we based observations on qualitative research, we made conclusions in the context of the data these programs provided on job placement, wages, and credential attainment. TCF and UMA developed a standard data request for each organization participating in the cohort to organize data on demographics of participants, data on training completion and credential attainment, and job placement and retention, among other topics like funding sources and key partnerships. .

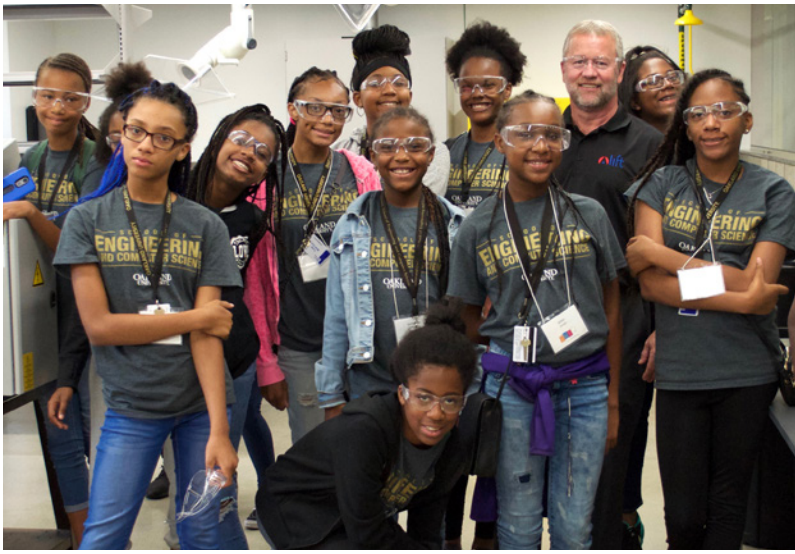
To help guide and ground the research, TCF and UMA organized an advisory board to provide a deeper knowledge of workforce development models. Our advisory board was made up of national workforce development thought leaders from academia, the private sector, nonprofits, and government. The advisory board provided a much-needed national framework to the local conversations with the eight cohort members.

REFLECTIONS

Given that each cohort organization participated in a three-hour roundtable group discussion, a series of one-on-one interviews, and monthly gatherings, it is impossible to fully share all the stories and moments of learning that informed TCF and UMA's insights and reflections. This process yielded shared experiences and pain-points across multiple organizations, despite working in different cities, with different stakeholders, and within different regional histories.

Many discrete discussions ran through the collection of stories and backgrounds of the cohort members. Individual organizations talked about the process and difficulty of finding skilled trainers to provide technical instruction who also have the social awareness to work with BIPOC communities, individuals who have little to no work experience, and those who live in neighborhoods that have experienced high amounts of trauma.

Each cohort organization approaches this process in their own way. Some have been able to successfully recruit diverse teachers from industry to work full time within their companies, such as Jane Addams Resource Corporation (JARC). Other organizations have built relationships with education partners that have developed train-the-trainer style programs to help teachers better understand their students' experiences, which is a strategy Northland Workforce Training Center (NWTC) and Manufacturing Renaissance (MR) have created. Finding capable teachers echoes part of another ongoing conversation: it is important to find the right people for the right position. This goes for many different roles within the education-to-career pathway support network: roles which include technical trainers, mentors, career coaches, employer recruitment and support, program marketing, and program advocates. These conversations also touch on the idea that the whole ecosystem needs to fill these roles rather than one individual organization having all of them under one roof.



Having many partnerships within a regional ecosystem — that contribute to the well-being and support of current and future employees *and* manufacturing businesses — was talked about by all cohort members. There is no one way to build these relationships, nor is there just one perfect combination of partners. For example, Lightweight Innovations For Tomorrow (LIFT) and Manufacturing x Digital (MxD) have built connections to technology developers through their non-workforce development work as Manufacturing USA Institutes. They have been able to turn those connections into partnerships which have opened new possibilities for teaching high school students about cutting-edge technologies. Many organizations discussed working on ways to strengthen their regional connections to the education and workforce development networks. Even though both networks are on the education continuum, they tend to operate very differently, leading cohort members to develop separate ways to build partnerships with individual groups.

The most consistent relationships that all organizations have are with networks of manufacturers and of social service providers. Yet again, there are unique ways

to manage these network relationships. Some have created fee-for-service incumbent training programs to bring manufacturers to the table — for example, JARC and Wisconsin Regional Training Partnership / Building Industry Group & Skilled Trades Employment Program (WRTP | BIG STEP) — and others rely on placing newly skilled workers in manufacturing businesses to build interest for ongoing programs, as is the case with MR. Creating relationships with social service providers often depends on building trust with individuals at each organization and providing education and insights about why the communities they serve should be pursuing careers in manufacturing.

Investing in relationships with social services, employers, and the larger ecosystem illustrates another key point: organizations often have to do a lot of work beyond skills training. One instance includes coaching employers to learn new practices and implement policies that correct for discrimination against BIPOC and women, one of the most often cited extra tasks. Some of this coaching is done one-on-one, in subtle ways, like Manufacturing Advocacy and Growth Network's (MAGNET) intern coach who helps employers understand and communicate expectations with their trainees. Whereas Menomonee Valley Partners (MVP) works with external partners to develop race and gender equity training programs for employers. JARC is launching a group discussion forum for many business leaders to come together to discuss race, equity, and inclusion barriers and strategies for change. This work outside of training illustrates gaps within the ecosystem. Many organizations have developed an informal process of taking on extra work, uncovering why it is needed, then finding new organizations to bring into the ecosystem to fill the gap. When this is not possible the next step is often to communicate the importance of doing the "new work" and then seek funding to cover the costs associated with it.

The day-to-day operations, program offerings, and service networks of each organization illustrate the effort it takes for a trainee to transition from no employment, or underemployment, to full time employment. Sometimes the effort is about planning new strategies for childcare, overcoming family and peer pressure, or covering rent and transportation costs. In other cases the effort is fighting against racist and inequitable employer practices. Each cohort leader shared, in their own way, their empathy and awareness of what it takes to commit to, what for many, is a very new and life-changing experience of learning skills needed to work in manufacturing. This awareness translates into many different strategies, all of which help make this big transition easier. As mentioned previously, all organizations have built social service networks in part to help with easing this major life transition and reducing the effort needed to solve problems associated with creating new childcare options, transportation, and even clothing. Organizations have implemented strategies internally as well. MR and MAGNET, for example, have created mentor programs to connect a trainee with someone who has shared life experiences to help guide them through the process and acknowledge their effort. NWTC and JARC offer career coaching to help individuals ease the transition into employment, preparing them before they start their career for how to navigate on-the-job conflicts and how to advocate for themselves. And, MVP created a women in manufacturing program to connect young women to professionals in careers in manufacturing to help build bridges that previous generations did not benefit from.

The following Profile Library section provides more information on these individual organizations for further study and to help uncover more connections and relationships across the I&I cohort members. *Industry & Inclusion: Manufacturing workforce strategies building an inclusive future* provides both deeper explanations as to how these themes were discussed and provides recommendations to change policies in response.

LIFT PROFILE

Introduction

As part of the Industry & Inclusion 4.0 Project, UMA interviewed cohort members and their partners to gather background information and details about how they create and deliver programs. From these discussions UMA generated Organizational Profiles for each of the eight cohort members. These Organizational Profiles are divided into two parts:

- **Technical Descriptions:** snapshots of each workforce development organization which include a brief description of their history, an overview of how their signature programs operate, self-identified keys to success, recent outcomes, and their future plans for scaling the impact of their programs.

- **Personal Profiles:** stakeholder interviews to gain a deeper understanding of the relationships that exist between the workforce development organization and the communities and employers they serve. These include trainees, industry employers, and partners in education.

Each Organizational Profile is meant to shed light on how each cohort member successfully navigated the process of designing and implementing an innovative workforce development solution for their region and for people they support. As a collection, these eight Organizational Profiles highlight the importance of: building partnerships and ecosystems, navigating stakeholder engagement, remaining open to ongoing improvements and learning, and understanding both employers' needs and the needs of the current and future workforce.

In the Personal Profiles you will find individual meaningful experiences of: how people's lives were changed by the training programs, how after graduating trainees return to give back to the next generation, and mentorships between intergenerational workers that share a culture and background. And like the Technical Descriptions, the collection of Personal Profiles highlight important themes. For example, the need for: committing to ongoing dialogue with the community to understand their needs, cultural awareness within manufacturing companies, and a broader definition and understanding of impact and outcomes.

The Organizational Profiles provide a glimpse into the inherent complexity of preparing a new workforce for an ever-changing industry. What UMA found compelling through these discussions is that each cohort member has become an expert in discrete topics like recruiting the right people, building an ecosystem, and supporting the transition of workers. Even though no two organizations operate in the same way, they have all come to understand key important principles: leverage what makes one's region unique; bring partners of all kinds to the table to develop ideas and get feedback; create a culture of learning and education as a lifelong process, within their own organizations and within the manufacturing businesses they work with; and new programs require social innovation — a change in behavior — on the part of trainers, trainees, employers, and funders.

Please visit urbanmfg.org/project/industry-and-inclusion-national-cohort to read our research, commentary, and the seven other cohort member profiles.

LIGHTWEIGHT INNOVATIONS FOR TOMORROW [LIFT]

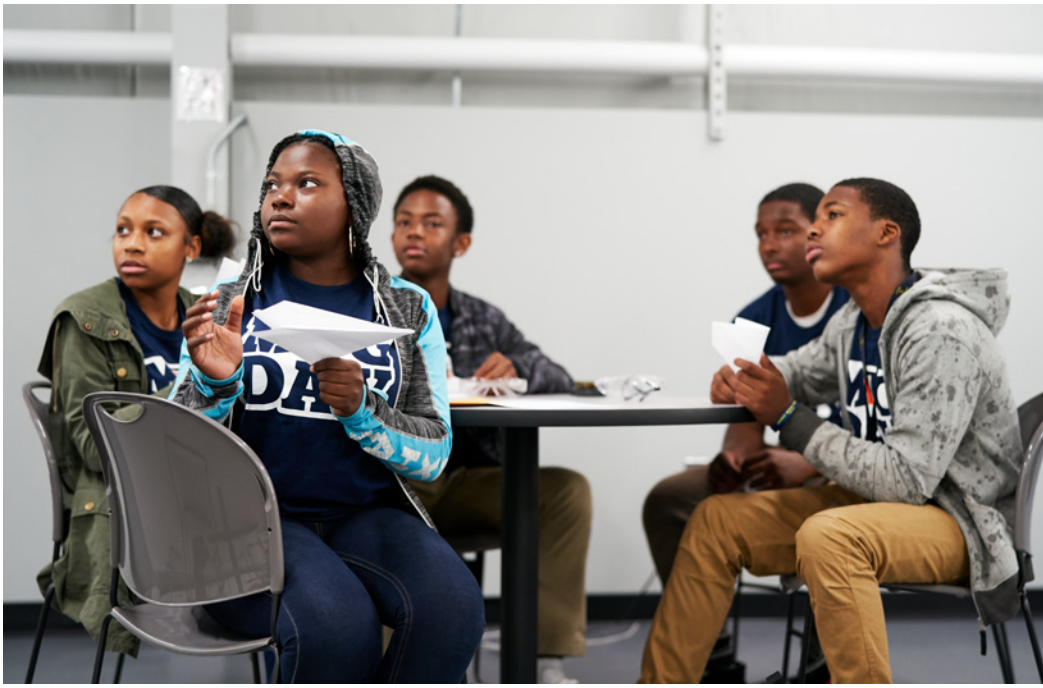
Driving American Technology and Talent Into the Future.

Detroit, Michigan

Brief Introduction, History, & Background

Since its founding in 2014, Lightweight Innovations For Tomorrow (LIFT), the Detroit-based, Department of Defense-supported national Manufacturing USA Innovation Institute, has invested in more than 40 replicable and scalable education and workforce development initiatives. All programs were focused on developing an advanced manufacturing talent pipeline and have been deployed, tested, and refined throughout the Midwest region. The focus on workforce was one of the original tasks defined on day one of LIFT opening its doors. LIFT was one of the first three National Manufacturing Innovation Institutes formed. In the seven years LIFT has been operating, they have been able to organize and work with over 150 partners and industry stakeholders to inform the development of its education and workforce development strategies.

In 2019, LIFT launched the Learning Lab, an immersive learning facility with seven unique labs, such as: Smart Factory Digital Twin Lab, Fundamental Skills Development Lab, and ASM Materials Science & Project Fabrication Lab. Labs are equipped with a wide variety of computer controlled technology from progressive sheet metal forming to drill presses, from plasma treating to extrusion presses, and from welding to flexible joining. Within those labs, LIFT delivers IGNITE, a curriculum which uses real industry challenges to prepare students for the most in-demand manufacturing careers. The Lab and the curriculum create engaging, technology-infused learning experiences inspiring students and encouraging participation in learning. Students are exposed to materials, technologies, processes, and systems, equipping them for success in careers as multiskilled technicians, technologists, and engineers. LIFT also delivers its Operation Next program, designed to train individuals for the most in-demand technician careers, in the Learning Lab.



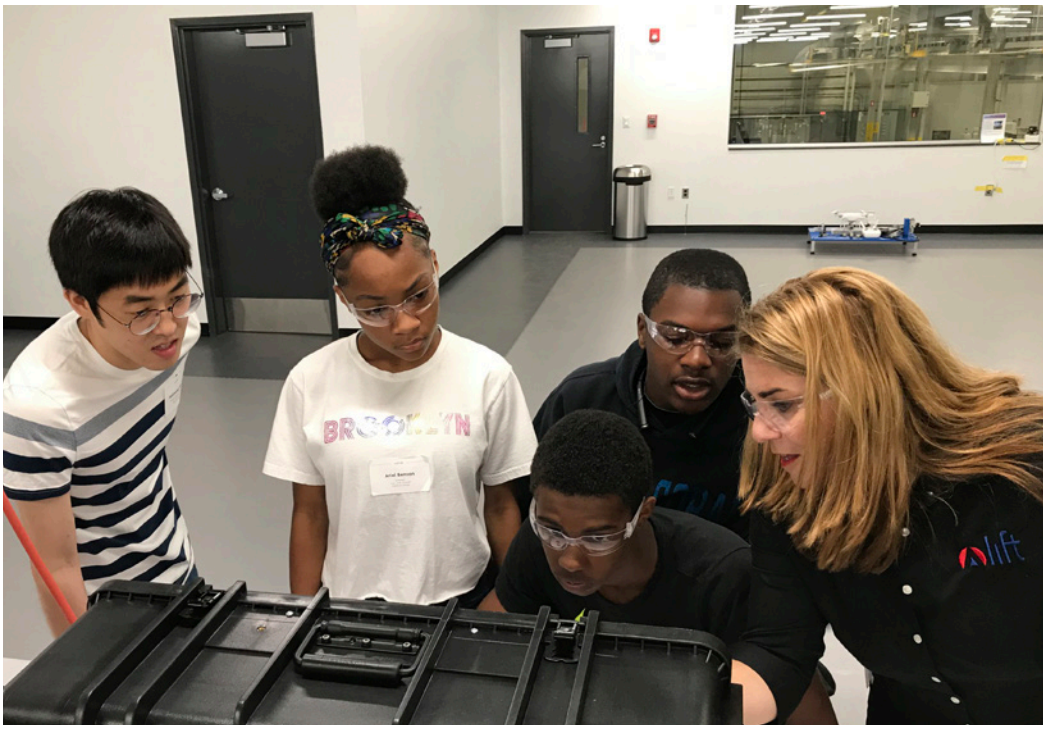
In the first year of operation, LIFT launched multiple partnerships with local schools and community-based organizations to provide immersive manufacturing learning experiences for students in the Learning Lab. One partnership with University Prep Academy, the largest charter school in the City of Detroit, resulted in 80 students completing performance-based training on the IGNITE curriculum in the LIFT Learning Lab daily. All of the students that enrolled in the UPrep IGNITE program were Black youth from low-income communities. Additionally, LIFT is training 30 individuals in the Operation Next training program, with those individuals earning industry-recognized credentials in CNC Operations or Welding.

Both the IGNITE and Operation Next programs are being implemented beyond the Learning Lab by educational providers nationwide.

About IGNITE and LIFT Learning Lab

LIFT developed IGNITE: Mastering Manufacturing, a three year program, to introduce students to technologies, concepts, and processes that are necessary for a successful career in manufacturing today and into the future.

The IGNITE program provides STEM-based education and career path exposure to students from the city's communities that have historically been left out of advanced manufacturing opportunities. In Detroit's high schools, 79 percent of the population is Black, and 11 percent is Latinx.[1] In the foundational year of IGNITE, students are introduced to materials, materials science, and engineering design processes. This includes deep dives into many types of everyday and cutting materials. In parallel, students learn the importance of observing and documenting their work and learning process. The second half of the year introduces key skills in safety and measuring, technical skills like CAD/CAM programming, robotics, understanding electricity and fluid mechanics, and higher level concepts in manufacturing like plant organization. In year two, students take advanced classes in topics from year one and are introduced to lean manufacturing practices. In their third year students work in groups to complete a capstone project — a project that builds on their existing skills from years one and two, while giving them new abilities to problem solve and work with industry specific and emerging technologies.

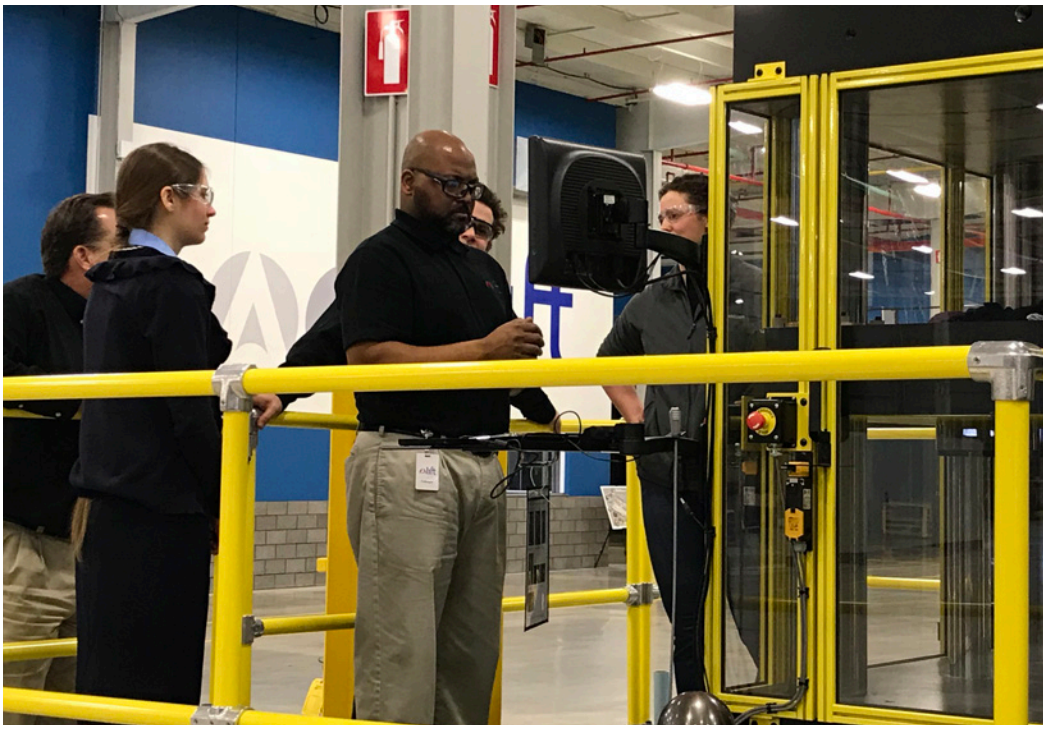


Operation Next is an accelerated hybrid training model combining virtual learning with hands-on performance-based training. The program was originally designed to train active duty military in their last six months of service to earn industry-recognized credentials in CNC machining, industrial technology maintenance, welding, or robotics. Operation Next is being expanded to also serve National Guard and Reserve members, military spouses, and more recently civilians impacted by the COVID-19 pandemic. The curriculum, delivered to all target audiences, is aligned to industry-recognized credentials defined by National Institute of Metalworking Skills (NIMS) and American Welding Society (AWS).

LIFT is able to deliver these training programs in-house via the Learning Lab, a 6,500-square-foot, state-of-the-art, interactive learning facility, located in the LIFT Manufacturing Innovation Institute. With these learning facilities co-located in LIFT's Smarter Manufacturing Innovation Lab, LIFT's students are exposed to new technologies and cutting-edge processes while learning the fundamentals they need to thrive in an advanced manufacturing workplace. The technology is being developed by LIFT members, a blend of for-profit companies, academic institutes, and government agencies. This means LIFT is always working with both industry-ready and next-generation technologies. To provide the training and instruction, LIFT depends on a network of contracted instructors rather than staffing

1 https://sdc.datadrivendetroit.org/profiles/97000US2612000-detroit-city-school-district-mi/

teachers themselves. LIFT only has one staff member dedicated to the Learning Lab, a manager with 15 years of experience in education, who helps run the day-to-day operations. She provides some co-teaching and co-curriculum development when needed. The manager builds relationships with instructors and hires them on a contract basis. For example, one of the instructors for their welding program teaches welding at a high school and one instructor in a CNC training program is an adjunct professor at a community college. In the IGNITE program, technical instructors collaborate with teachers from the high school to deliver all aspects of the education and student support. The combination of the IGNITE curriculum and the Learning Lab provides a unique learning environment where students gain insights into manufacturing skills and careers as well as exposure to the design and engineering of technology.



LIFT worked with over 150 stakeholders across five states to pilot 40 programs. The ongoing relationship with local industry partners, members of LIFT, and technology developers helps to make sure the curriculum and skill development is in line with what is needed for immediate job placement and lasting success.

"If you are pursuing a career in the advanced manufacturing space you have to be engaged in ongoing education. The pace of technology is changing so quickly, it is not realistic to think it will be the same thing forever. This requires people to embrace wanting to learn and keep up with technology and requires workforce development programs to be open to ongoing improvements."

-Jacqui Miekszstyn, Talent & Workforce Strategist

Keys to Success

For LIFT to succeed in developing workforce training they knew from the beginning that it had to look differently. Their goal was to work with partners in the region to do something innovative, rather than parachuting in with the new solution. In their first years, Similarly, LIFT took an open approach to creating the Learning Lab. From the start, LIFT wanted the Learning Lab to be seen as a community asset, to have it be an educational space, not just an activity space or a space just for industry and technology. Getting students in the door took some effort. LIFT originally approached several school systems in the region about using the LIFT Learning Lab as a performance-based training center for their students. After nearly 18 months of planning, LIFT ultimately partnered with University Prep Academies, Detroit's largest charter school system. However, several barriers to partnership were identified, including finding transportation to students. The Skillman Foundation — a nonprofit helping Detroit children gain access to educational and economic opportunities — provided

support to cover the cost of transportation and within a couple months students from University Prep Academies were attending classes at the Learning Lab. This led to the first cohort of high school students starting the three-year curriculum in 2019.

LIFT is aware that technical training is only one aspect of making sure that people are successful, and that individual students need help not just getting a job but being successful in their careers long-term. To help achieve this, LIFT has developed a relationship with local Michigan Works! Agencies,Michigans' Workforce Investment Board (WIB). Through this partnership students can get help identifying other supportive and wraparound services. This allows LIFT to focus on the training, and the WIB can help connect the dots and identify, financial aid, transportation assistance, child care assistance, and financial literacy planning for students in any target group. While many employers and trainers might first approach the WIB for funding to cover training costs, partnership typically goes beyond that. The WIB becomes another layer of support and coaching which increases students' abilities to commit and succeed.

"It is a challenge to find an instructor that knows how to weld, or be a CNC operator, has teaching abilities, and then add to that, the ability to work with students of all ages who have experienced trauma. It is difficult to find the unicorn instructors and so we are looking at resources to help our instructors, at LIFT, and those involved in the workforce development in the region."

-Jacqui Miekszstyn, Talent & Workforce Strategist

Outcomes

Since launching the Learning Lab in Summer 2020, LIFT has also trained 10 students in welding and CNC Operations, earning relevant industry-recognized credentials. While LIFT has been impacted by restrictions from the COVID-19 pandemic, pausing in-person learning for much of 2020, LIFT is planning to continue to offer virtual components of both IGNITE and Operation Next. Forty-five students remain enrolled in IGNITE through the partnership with UPrep. Technologies like Siemens Digital Twinning have allowed LIFT to provide students cutting-edge virtual learning experiences using technology that is being adopted globally as an industry standard — now much more rapidly because of the pandemic.

LIFT's impact beyond the number of students trained can be seen in the stakeholder network they have built and continue to learn from and with. In their short history, they have worked with over 150 education and workforce development stakeholders in Michigan, Indiana, Ohio, Tennessee, and Kentucky to launch educational workforce and technology development support. This network has allowed LIFT to explore the deeper question: how do you create workforce development programs around technology that is constantly changing and reframing the skills necessary for a career in manufacturing?

The Future [Scaling]

LIFT from the outset had a focus on scaling their programming. This led them to build their IGNITE curriculum and Learning Lab using a modular approach, making it possible for other cities, states, or regions to adopt and implement some or all modules. The curriculum, as seen at LIFT's Detroit HQ, can be modified for different age groups and student backgrounds, from high school to community college to workforce development models, whereas the different labs that make up the larger Learning Lab can be established individually or together. The modularity also allows different partnerships and stakeholders to take shape. The Operation Next program is scaling to new military bases around the country, including expanding to communities with significant National Guard presence, creating new partnerships at each location between the military, technical instructors, and industry. There is also a project supported by National

Institute of Standards Technology (NIST) to use the same structure as Operation Next but to bring it to small and medium manufacturers to help them retrain their incumbent workforce, specifically individuals who have been displaced because of COVID. One pilot program in Pittsburgh, PA is bringing together ARM (Advanced Robotics for Manufacturing, another Manufacturing Innovation Institute), university partners, and regional industry.

Another scaling strategy is to increase the number of students learning at the Lab and to have the space fully utilized. Currently the interest is there, and increasing use will require building new relationships with charter schools like University Prep and finding ways to navigate previous barriers to working with the public school system. While virtual classes and learning was not part of their original vision, what they have learned out of necessity has opened up the possibility of ongoing online learning even after COVID-19 restrictions have been removed.

"Getting industry engaged with new workforce programs, especially those designed to prepare a talent pipeline into the future, can be a tough sell. Manufacturers, especially small and medium-sized manufacturers, are so (rightfully) focused on their immediate workforce needs they often aren't looking further out to their longer term needs. It's a challenge to demonstrate the value and ROI to companies to get them involved and invested in developing their workforce."

-Jacqui Miekszstyn, Talent & Workforce Strategist

Lastly, getting industry more engaged will help scale outcomes and program opportunities. The early partnerships that LIFT built were from the education and workforce development sector, local workforce boards, community colleges, universities, and some community development organizations. These partners were vital in helping provide clarity on what to teach, how to teach it, and who to focus on. As with most new approaches to workforce development, some manufacturers are engaged and onboard from the beginning, but the majority are hesitant to get behind an initiative without a track record. LIFT is fortunate to have found some early adopters, through the Aluminum Extruders Council due to their use of Siemens twinning technology. The belief is, as more students (in all three tracks) complete the programming, LIFT can generate a track record of placements and success, which will draw in more manufacturers and industry partners, increasing demand for skilled graduates, and therefore increasing the resources available to get more people engaged and learning.

Brandon Lane

Science Curriculum Director

UPrep Academy

As the UPrep Academy Science Curriculum Director, Brandon Lane is an educator who believes that his role is not only to help youth succeed academically, but to play the role of an ethnographer and marketer for manufacturing.

"Our students are looking for something that doesn't waste their time," said Lane. "Something that will be meaningful to their lives and their circumstances today." Demonstrating how manufacturing can positively impact their situations, both professionally and personally, is Lane's effective approach to getting youth interested in the industry.

But selling manufacturing as a career path for youth has its challenges. Over the years, Lane has had students that are involved in narcotics, and their willingness to change course all depends on their relationship with their family. Some students are raised in that life, while others are sheltered from it.

"For students raised in the game, their father might have a position in the neighborhood, and that ends up being their entire life. Even if they wanted to leave, they can't," explained Lane. "But then you have instances where you may have a kid whose family has decided, *although we're doing this, you can never be a part of it*." With delicate situations at home like that for youth, getting them focused on the right life trajectory requires more than a slick in-class presentation and a glossy trade publication.

"This is where you have to be an ethnographer," Lane said. "You have to be willing to go into the community and speak with the parents, and have a very honest conversation about outcomes, w*hat do you want for your kid's life?* And then it's important to have that conversation with the child as well."

Speaking with the community is a step that Lane feels is often forgotten in the education system. What the community sometimes wants their kids to learn from school is more nuanced than most educators think. "With schools, our idea of what a child needs is education. We think that they need to have some level of literacy in particular content areas. Great. But sometimes you'll ask parents, what do you think your kid needs, and they really want you to value their child's personhood and to be willing to push them, rather than coddle them because of fear or deficit thinking because of the zip code they come from," explained Lane.

According to him, this conversation with the community may start with finding out what the kids need to learn, but that is only the beginning. The whole education system, including programs like LIFT and their partners, need to be involved in an ongoing dialogue with the community.

"Company or school leaders need to go to churches and rec centers, and they need to go to corner stores. And they need to ask some of these people, even just regular residents, *what does the community need? What do you*

feel is important to you, on this block?" described Lane. "*Oh, you need a playground? We have this partner, and we're going to meet you halfway. Are you willing to come to this? Let's build the playground together.* Go into the community, identify their needs, but don't do it for them. Do it together."

Once a connection is formed between the education system and the community, Lane strongly believes in exposing the kids to life outside of that community. Lane grew up in Philadelphia, where he ran track in high school, and competed all over the East Coast. Seeing different places was eye opening for him, and gave him ideas for what he wanted to do with his life. Lane believes the same can work with youth today when guiding them towards manufacturing.

"We have a travel abroad program. We took our kids to Europe, and they saw something. That's the tipping point," Lane explained. "That's that critical point where you could probably pour in something, and they're changed forever."

Deon Hamilton

Global Account Manager

Siemens

When Deon Hamilton was hired by Siemens in 2007, he was the only Black sales engineer on the industrial side of their sales department. Although he was grateful to be a part of a great organization, there were times when the pressure felt immense. Fast forward 14 years later and he is a Tier 1 Automotive Global Account Manager for Siemens. How did he make it to where he is today?

"It was very overwhelming at times. I felt like the world was on my shoulders," admitted Hamilton. "But thankfully, some of the core spiritual aspects of myself really played a part in helping me get through that. The aspect of faith, knowing that God has me here for a reason, knowing that I wasn't here by accident, but that I was intentionally placed here to do great things. It gave me more confidence to push past some of those negative feelings."

While Hamilton was finding hope in the divine, experienced employees at the company also mentored him. "I will say, I have had some awesome people within Siemens offer advice to me along the way. But at the end of the day, it came down to my personal faith." Realizing that we all have a responsibility to give back, Deon has sought ways to serve the community and help build bridges between corporate America and the inner city — particularly with LIFT.

He explains that there were several reasons Siemens wanted to partner with LIFT. "LIFT's location right in Detroit, is pretty crucial for me and the automotive industry that I help serve," explained Hamilton. "I was born and raised in Detroit, and the fact that there's a state-of-the-art facility in Detroit, whose mission is to prepare the workforce, of today and of tomorrow with access to new technologies relevant to manufacturing just resonated with me. That resonates with Siemens overall, in terms of what we're trying to do, and the challenges that we see in our industry."

Seeing the possibilities in his hometown for both students at LIFT and the company that he works for gives him a sense of pride. Most notably, the partnership is an example of two entities involved in manufacturing in different ways, and with the same view of what the industry needs.

"Overall, being a part of LIFT and their mission, the fact that their mission aligns with our mission, to really help this next generation as we move into this next era of digitalization within manufacturing is critical," continued Hamilton. "There are a lot of common points between both organizations."

According to Hamilton, what makes LIFT unique among the other manufacturing training organizations around the country that Siemens partners with is their well-rounded focus on both education and workplace development. Another defining feature is the fact that LIFT has students and professionals working under the same roof, using the latest in Siemens technologies.

“LIFT has manufacturing equipment on their floor, to help roll out some of these new technologies within digital manufacturing,” said Hamilton.

Hamilton sees the changing technologies in the industry as an opportunity to attract younger workers to replace the many baby boomer employees that are retiring. He is concerned that there will not be enough new employees to fill the gap, which is why he and Siemens are so dedicated to ensuring LIFT attracts youth at an early age.

“There are a lot of organizations that are emphasizing coding to elementary and middle school kids. Learning to write code is becoming more and more important, because these are the jobs of the future,” he emphasized. “We really need to educate and capture the hearts of the younger generation, so that they desire these types of careers.“

Exposing kids to new technology will make Hamilton’s job much easier in the long run, because he likes to hire people who have a variety of experiences. The engineers of today must have multiple skill sets, with the knowledge of how and when to apply them.

“The ability to be agile is becoming more critical, because things are changing so fast. And if you have a wide range of experiences, a wide range of handling different problems, as opposed to specializing in one area, it makes you more marketable as a person in our industry,” Hamilton explained. “It makes adapting to these new technologies a lot easier, because you’re not so focused on one particular area. You develop the capacity to engage on multiple different levels, multiple different areas.”

With Siemens, Hamilton mentors younger employees by inviting them to meetings so that they can see how he conducts business. He sees LIFT as an opportunity to do that for the younger generation, especially with students coming from the same inner-city neighborhoods that he grew up in. When he was the only Black sales engineer in sight, he believed that he was divinely placed there for a reason. The more he is involved with LIFT, the more he sees why. “That’s something that I’m passionate about, and I look forward to working closely with LIFT and Siemens as we carve out mentorship opportunities to impact the lives of inner-city youth.”

Marianne Donoghue

Learning Lab Director

LIFT

When students look back at their time at a school or in a training program, the educators who they remember most are often the ones willing to go the extra mile to help them succeed. As the Director of the Learning Lab at LIFT, Marianne Donoghue manages the operations of seven spaces dedicated to training students from K-12 all the way up to adult workers. Though the work of a director is not the same as that of an instructor.

"Being a former teacher, I think my biggest concern was that I wouldn't be interacting with students," said Donoghue. She worked as a high school teacher for 15 years, and is used to engaging directly with students. "That's what I like the most. Being able to make a difference."

When she was a high school teacher, she taught mathematics in Pontiac, Michigan to students from diverse backgrounds. Managing their expectations for what they should get out of education and teaching students who were culturally different from her gave her insight that she brings to her role at LIFT. "When I design programs, I know these are probably the resources they're going to have at home," Donoghue said. "I feel like my understanding is a little bit deeper."

She designs programs that focus on hands-on and interactive work, so that students can both work in the lab and observe what the professionals are doing in LIFT's Research and Engineering Institute. That's where students see what the real work looks like. "We talk about what technicians are doing, and I show them these are the skill sets that they will have," said Donoghue. "I found that worked really well."

Earlier on in the pandemic, Donoghue designed a program in partnership with the United Way to send STEM kits to students so they could do that hands-on work at home.

Prior to the pandemic, the time in the lab allowed Donoghue to walk around and observe how the students do their experiments. Typically, each student comes to the lab with a teacher from their school, and this helps Donoghue build stronger relationships with them. "I would start to see their personalities. Do they get frustrated fast? Do they seem to like it?" Whether in person or online, she finds that the best way to encourage students is to say something positive about what they are doing. "Even if you're going to critique them, you always want to say you're really good at this, but you need to change that," Donoghue explained.

On top of giving students technical skills, she goes one step further. "We do a résumé building workshop," she described. "I started doing it in the second to last week of the program, but once I started doing it closer to the beginning I noticed the students actually got really motivated."

Doing the workshop at the beginning gives the students more time to get a second certification than at the end

of the program when there are only two weeks left. Students bring their résumés to Donoghue to review and she instructs them on how to emphasize their talents. “I show them where the credentials they are earning should go on their résumés, because sometimes I think people get these credentials, and nobody tells them how to use them,” Donoghue lamented. “They need to know how to word their résumés to market themselves. I talk about very specific career wording and how it should be framed. So when a company sees it, they’re going to know, oh, this person is what we want.”

LIFT also does career talks, where Donoghue gives students a holistic view by inviting industry partners to attend. They are very receptive to her tips on how to talk to students in an engaging manner. They talk about the credentials they will earn, and what they can do with those credentials. If students do want to pursue higher education, but don’t have the resources, Donoghue helps them find the funding and coaches them on how to write a letter of intent.

“Whether it be to go get a job on the production floor or become a welding engineer, I like to give them options,” she said.

Monica Rosas

Trainee

LIFT

A typical day for high school student Monica Rosas consists of class in the morning and work in the afternoon. She works two part-time jobs, and some days she has cross country after school.

"I try to keep a very tight schedule," said Rosas. "One of my part time jobs schedules me almost all the time. At my other job, I just pick up shifts whenever I can." The Saturday of our conversation, Rosas had a cross country meet in the morning, and worked in the afternoon.

As active as she is, her parents ensure that she knows which portion of her time is the most important. "In my house, school always comes first. And will always come first," explained Rosas. "So if work is too much, I will back off so I can focus on my education."

Prior to joining LIFT in July 2020, she became aware of the advantages to working in manufacturing through her dad, who assembled car seats for Lear. Though her father is now retired after working 12 years in the industry, Rosas finds inspiration in him. She knew that companies employed people and robotics to create products and equipment for a variety of industries. The moment she joined LIFT, she was excited to learn skills that she could use to build things.

"The training was very similar to what I experienced in school, because I was in a welding program over there, too," described Rosas. "It was the same teacher. I like learning from this teacher, because he was very informative. He would show us everything in the book, but when the lessons were over, we would go to the machine. We'd learn everything and see everything hands-on. It made learning a lot more fun." Rosas believed that the practical work with the machines helped her to remember the theoretical work from class.

It also helped that she had been in a welding program at her high school since her junior year, which made it easier for her to pick up on the training at LIFT. "I would say it took me about two weeks to adjust," she recalled. After she became comfortable with the program, the defining moment came when an industry partner came to speak to the class about career development. The presentation gave her ideas for what she could do after high school.

"I really love welding, and I knew I wanted to do that as a career, but I didn't know which route to take. Just hearing people come in, like the rep from Miller Electric, talking about what he did inspired me to want to be a welding engineer," said Rosas, who plans to get an associates degree at Washtenaw Community College. "It just excited me to know that there was that option to go into." Rosas loves the idea of welding one day and being in the office the next.

Where does Rosas see her career leading to? The automotive industry. "I've always liked cars, because they seem really cool to me. When I was picking my classes out my junior year, I didn't know if I wanted to take welding or the auto body shop," she explained. "Learning more about welding, how welding is a big part

of automotive, and seeing other kids from the auto body shop helped me to see I can do what they do too."

If you think the clarity of vision that Rosas has for her career development is impressive, wait until you know how far she's willing to go to achieve her goals. One of her teachers helped her see things clearly. "I hope to get into a large company. With my Hispanic background and being bilingual, I will be able to travel out and help other companies," said Rosas. "There's a lot of automotive companies in Mexico, so sending me out there to help communicate with these workers and show them what to do is what I hope to do."

When asked if entrepreneurship is something that she may want to pursue, Rosas is not sure, but is not prepared to rule it out. "A lot of my family run their own businesses. My grandma, she has her own store, and my aunt has her own tech company. So this is something I will feel competent in doing because of the support of my family, and knowing what business is like."

ABOUT THE ORGANIZERS

The Urban Manufacturing Alliance (UMA) advances place-based strategies that create more equitable communities by building community wealth through employment, ownership, and entrepreneurship through manufacturing. We connect and convene hundreds of partners across more than 200 cities, helping them learn from one another, and act as a collaborative ecosystem builder that supports local manufacturing communities and leads a national movement. UMA then partners with the practitioners in those ecosystems to create local, regional, and national research. By documenting the voices, trends, and data emerging from manufacturing communities, we provide practitioners, policymakers, and leaders with the references they need to develop new, equitable models of economic development. From that research, we tell stories, taking the trends we observe and crafting them into rich narratives that capture how our members spark change.

The Century Foundation (TCF) is a progressive, independent think tank that conducts research, develops solutions, and drives policy change to make people's lives better. We pursue economic, racial, and gender equity in education, health care, and work. In this pivotal moment in America, we stand with a strong and firm commitment to developing policy solutions that will help this country truly realize racial justice. Founded in 1919 by the progressive business leader Edward Filene, TCF is one of the oldest public policy research institutes in the country. TCF pursues its mission by conducting timely, nonpartisan research and policy analysis that informs citizens, guides policymakers, and reshapes what government does for the better. We are distinguished by our commitment to a thoughtful and targeted strategy to bring our work to those who can contribute to making practical affirmative change. Our experts come from academia, journalism, and public service—all with a shared commitment to advancing progressive ideas that benefit the public good.

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APPENDICES

For further learning, please consider:

Industry & Inclusion Opening Commentary

- Racial Equity and Advancing the Future of Manufacturing

Industry & Inclusion Project Webinar Takeaways & Event Recordings:

- Pursuing Equity, Inclusion, and Industrial Rebirth in the Age of Covid 19
- Advancing Equity and Inclusion in Manufacturing Credentialing and Technology
- Creating the Future Manufacturing Workforce by Enhancing Diversity and Addressing the Skills Shortage
- Partnership and Relationship Innovation To Build Race-Conscious Advanced Manufacturing Training Programs