



# 2023

## *Southwestern Pennsylvania* Manufacturing Workforce & Training Demand Study



Powered by **Catalyst Connection**  
Sponsored by **The Appalachian Regional Commission**  
Prepared by **Dr. Deborah D Stine**, Founder, **The Science and Technology Policy Academy**

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Providing In-Depth Education on S&T Policy



## Executive Summary

As a part of a grant initiative funded by the Appalachian Regional Commission (ARC), Catalyst Connection gathered information from manufacturing companies to identify near-term entry-level workforce and training needs. The purpose of this study is to help ensure that Catalyst Connection's efforts support the southwestern PA manufacturing community and make wise use of the taxpayer dollars that ARC has provided for this initiative.

Catalyst Connection gathered data, information, and opinions from a total of 39 small and medium-sized manufacturing companies through a survey. This survey included the same questions as Catalyst asked in 2021 plus additional questions about some of Catalyst's workforce training activities and partnerships added since the 2021 survey. Information collected focused on three categories:

- Technical Workforce Positions and Hiring Expectations
- Diversity, Equity, and Inclusion Initiatives.
- Training Expectations and Needs

The workforce population that was the focus of this information-gathering activity were entry-level workers. For this study, Catalyst Connection defined entry-level as workers with high school degrees, high school technical/vocational education, pre-apprenticeship, or community college education but no or limited experience. Incumbent training activities were also included in the survey.



## Technical Workforce Positions and Hiring Expectations

### Finding 1: All employers surveyed are hiring, or expect to hire, entry-level manufacturing workers in 2023.

Thirty-nine manufacturing companies reported they planned to hire on the order of 1,215 employees in 2023. As shown in Table 1, most openings are for assembly line workers (150), CNC machinist (150), inspectors/testers (145), and general maintenance (140).

The employer hiring expectations for 2023 are far higher than that when the same question was asked in 2021. More companies responded in 2023 (39) than in 2019 (12), but this may be because they had more incentive to respond due to their hiring needs.

Another interesting comparison is Catalyst Connection's 2018 Manufacturing Employment Demand Study, where 111 companies responding indicated that they had 1,070 to 2,300 current open positions, of which one-third were entry-level. The 2023 number of openings are certainly in line with that 2019 pre-pandemic survey.

**Table 1:** Maximum Total Number of Hires Expected at 39 Southwest Pennsylvania Manufacturing Companies in 2021 and 2023, by Occupation Based on Catalyst Connection Survey.

Position	Positions Expected to Hire in 2021 (12 companies)	Positions Expected to Hire in 2023 (39 companies)
Assembly line workers	45	150
Inspectors/testers	15	145
Packaging & filling machine operators	0	120
Welders/solderers	25	90
Technical Sales	10	80
General Maintenance	25	140
Shipping & Receiving	25	105
Tech Customer Service	20	90
Certified Production Technician	20	70
CNC Machinist	40	150
Certified Logistics Technician	0	15
Other	15	60
<b>TOTAL</b>	<b>240</b>	<b>1215</b>

## Finding 2: Most manufacturers are having a hard time filling their current entry-level openings.

The most common challenges in hiring include lack of qualified applicants (76%), insufficient applicants (58%), and competition with other manufacturers in the region for the top applicants (50%). When turning down a job offer, the most common reasons are shift work requirements (44%), wages too low (41%), location too far from home (31%), and a better salary and benefits offer from another employer (31%).

### ***Some Employers' Suggestions to Make it Easier to Find Employees...***

- *"Create some sort of job board to help funnel applicants into companies that utilize Catalyst Connection."*
- *"A central publication or website that had a bank of entry-level technical employees looking for work; like connecting high school tech schools to the employer."*
- *"The staffing agency temp-to-hire model has worked well for us. Due to low skilled turnover the vast majority of our hiring is temp-to-hire with on-the-job training, which allows us to gauge the prospective employee's reliability, willingness to follow instructions, aptitude, etc. prior to making an offer of full-time employment."*



## Diversity, Equity, and Inclusion Initiatives

*A new addition to Catalyst's survey focused on manufacturer's diversity, equity, and inclusion initiatives.*

**Finding 3: Over 80% of companies indicated that their workforce is more diverse than 5 years ago and over 50% of companies indicated that diversifying their workforce is a major priority.**

The greatest change is the increase in the number of women in the workforce.

Companies have also increased the number of new employees that they hire who are people of color and those with disabilities, veterans, refugees, and a history of incarceration. That being said, the majority of employees are still white non-veteran males without disabilities at most companies.

### *Some Employer Perspectives...*

- *"We now have 10 females here, which is more than we have had in the last two years I have been here!"*
- *[Our] "male to female ratio has increased from three females to sixteen."*
- *[We] "Have hired trans, refugees and continue to maintain a diverse workforce."*
- *[We have a] "Larger applicant pool of female or minority candidates."*
- *"We are teaching DE&I training to all employees and we have reached out to numerous organizations for assistance."*
- *"We hope to talk to the students at the local high schools and technical schools to give them an understanding of our business for both boys and girls."*



## Training Expectations and Needs

All companies provide on-the-job training with majority saying **pre-employment is important** in hiring entry-level workers.

**Finding 4: Most manufacturers indicate that an applicant needs both technical and soft skills to obtain a job offer and for long-term employment.**

Technical skills needed include basic mechanical skills (73%) and basic technical training, problem-solving skills, and math/measurement skills (all at 62%). Top soft skills needed are basic employability skills (95%) and basic communication skills (85%). For specialized training needs, most companies were interested in CNC machine training.

### ***An Employer Perspective...***

*“Safety is a big one. Most kids don't understand the dangers of worksites. And couple that with youngsters feeling of being invincible, it makes for a dangerous situation. I think the more the kids can see real life, real situation accidents, or reports of accidents with video or something to really show them that injuries happen, and they are real will help reduce them in the field. Lean training would be another if it falls into the other training. Getting young workers to think about how to fix problems, investigate issues, and take control of things would be another huge benefit. Most young workers I see just sort of follow the leader and stay in that "rut" of what they were taught.”*

**Finding 5: The biggest challenge employers face in training their current workforce is insufficient time and money.**

For incumbent workers, taking employees off the floor is hard when companies are already short-staffed. Other considerations are insufficient available funding for training, finding good trainers, and the need for training the trainers to meet their specific company needs.

As a result, on-the-job training with an experienced worker is more useful than having a set training curriculum that is not specific for their industry or company.



## Conclusion

Overall, the **2023 findings** of the high demand for employees and the challenge in recruiting individuals to fill those roles are the **same as those in 2021**, but there is more intensity, now that **manufacturing employment is back** at pre-pandemic levels.

*On the bright side*, manufacturers indicate that the **diversity** of the manufacturing workforce is **increasing**, particularly regarding women. Manufacturers training needs are also similar to those in 2021, and their assessment of Catalyst's programs remain high though they suggest more interactions with companies before, during and after training.





# 2023 Southwest Pennsylvania Manufacturing Workforce and Training Demand Survey

## Overview

Thirty-nine Southwest Pennsylvania small and medium manufacturing companies responded to a Catalyst Connection survey that asked about their

- Technical Workforce Positions and Employer Hiring Expectations;
- Workforce Diversity
- Training Expectations and Needs

Catalyst conducted similar surveys in 2018 and 2021. The questions asked in 2021 and 2023 are generally the same; however, this survey increased the number of questions asked about workforce diversity.

**The following sections provides companies' responses to the questions and includes both quantitative and qualitative data.** Information in italics is quoted material from the companies. Appendix provides the list of responding manufacturing employers and information about them.



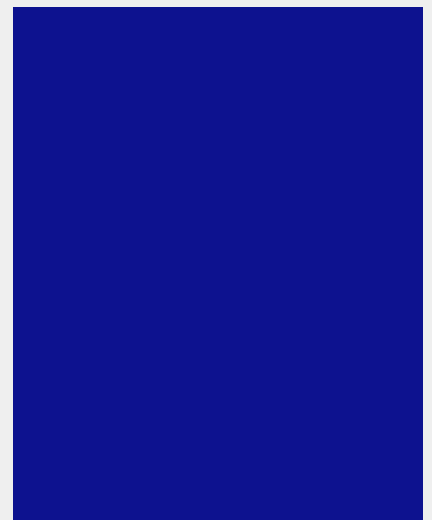
## Results of Information and Data Collection

### *Technical Workforce Positions and Hiring Expectations*

As shown in the table below, manufacturer employer hiring expectations for 2023 are far higher than that when the same question was asked in 2021. More companies responded in 2023 than in 2019, but this may be because they had more incentive to respond due to their hiring needs.

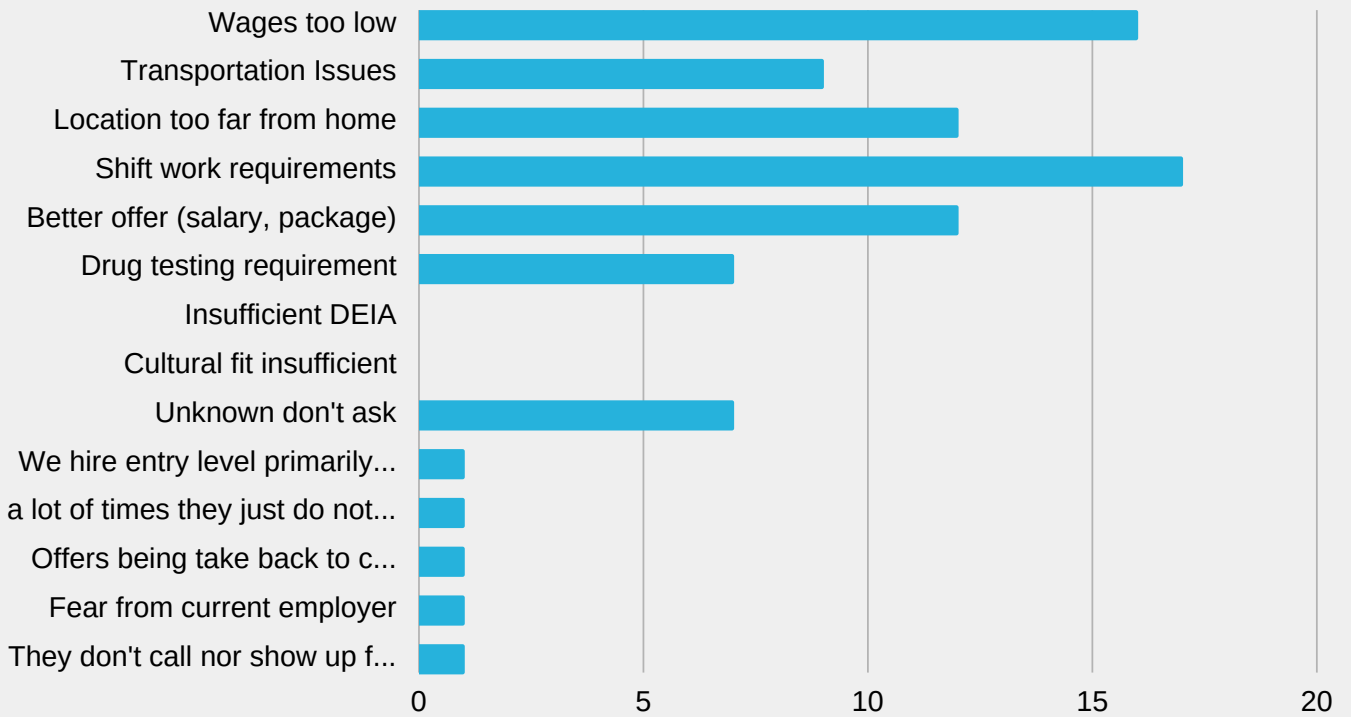
*The table below provides the results:*

Position	Positions Expected to Hire in 2021 (12 companies)	Positions Expected to Hire in 2023 (39 companies)
Assembly line workers	45	150
Inspectors/testers	15	145
Packaging & filling machine operators	0	120
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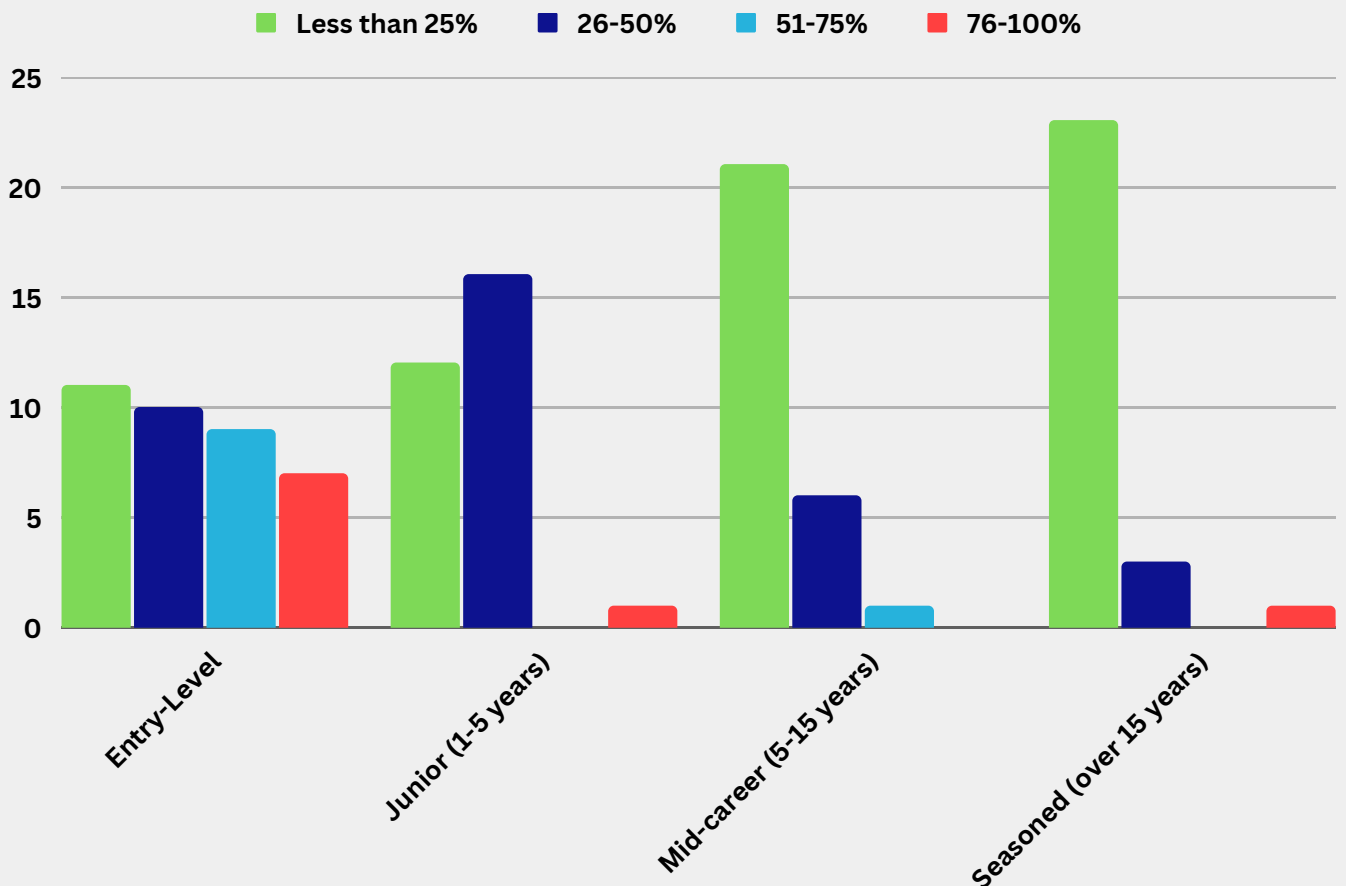


## When someone turns down an employment offer, what reasons do they give?

39 responses

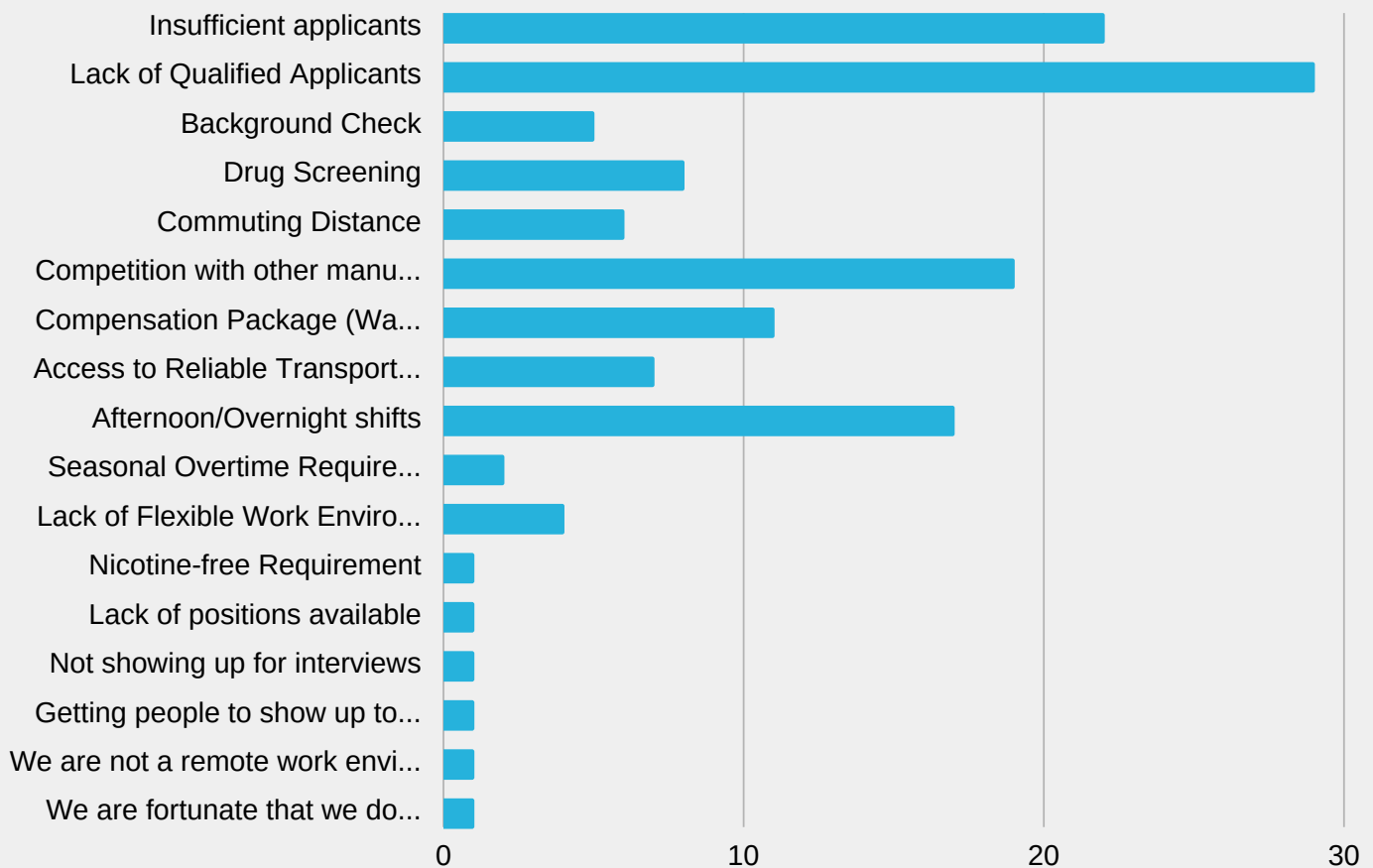


## What percentage of new hires would you identify as:



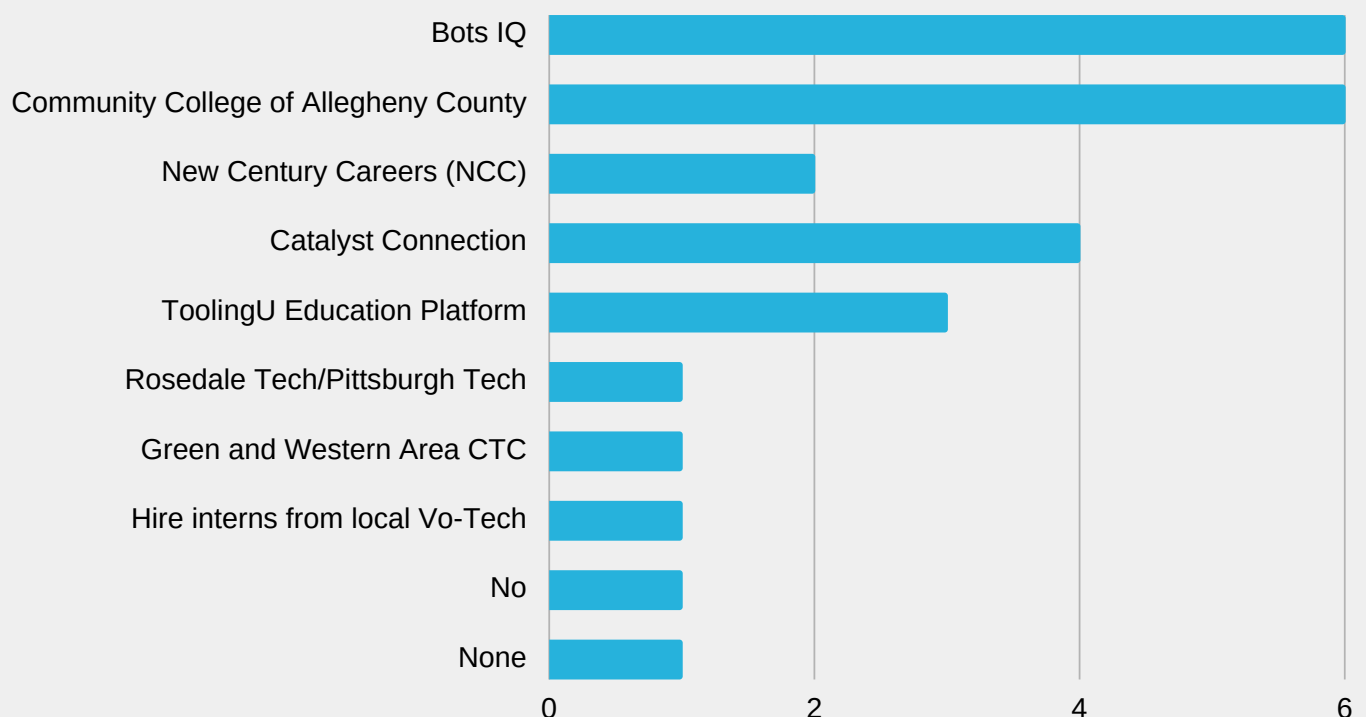
## When it comes to hiring, what are your top five challenges?

39 responses



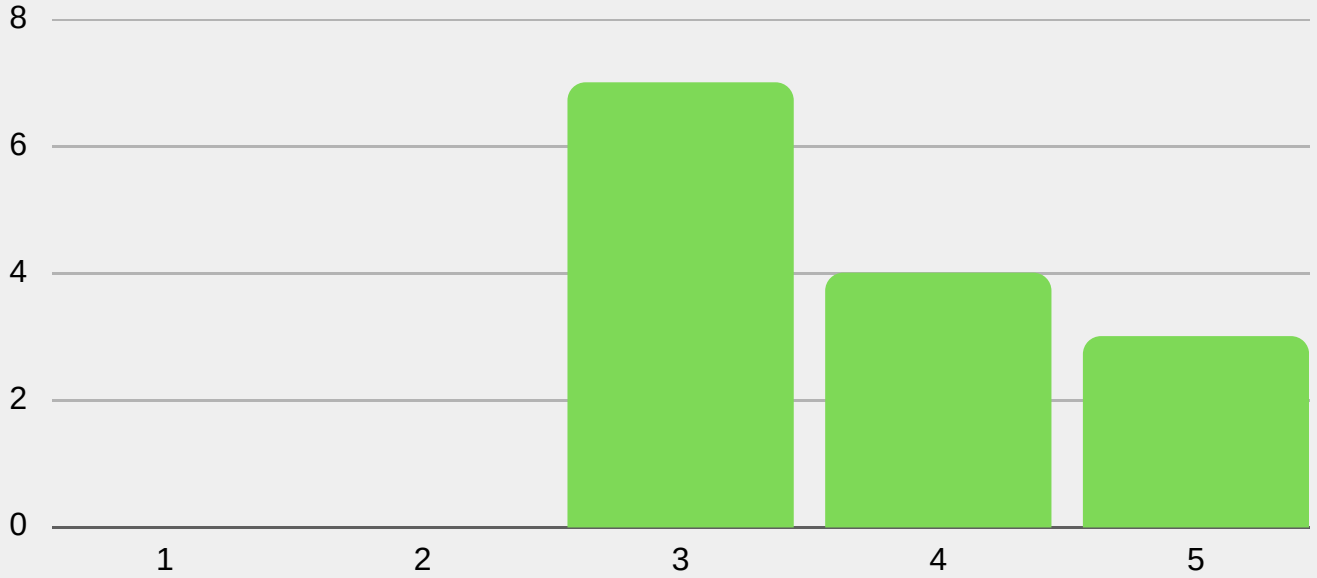
## Have you employed any new workers in the past three years who participated in manufacturing educational programs with the following organizations? (you may pick more than one)

17 responses



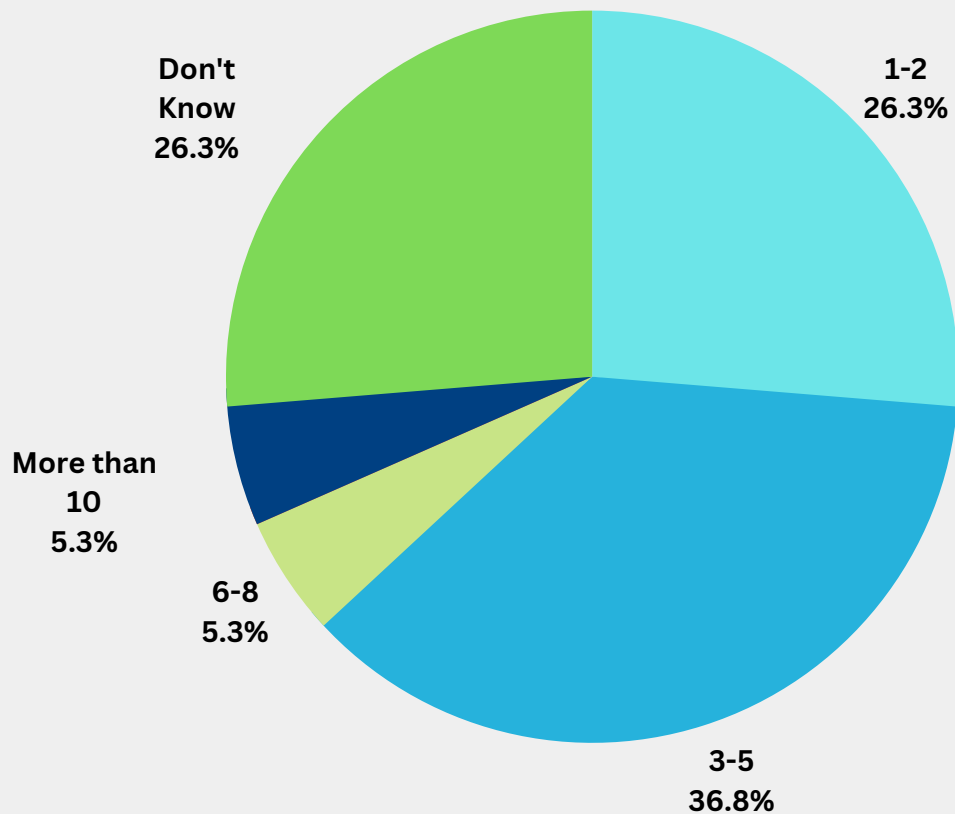
**If yes, how would you assess the graduates of these programs relative to other new hires? For example, are they more or less prepared for joining your company?**

14 responses



**If possible, please provide information on how many individuals you hired who participated in these programs in the past three years.**

19 responses



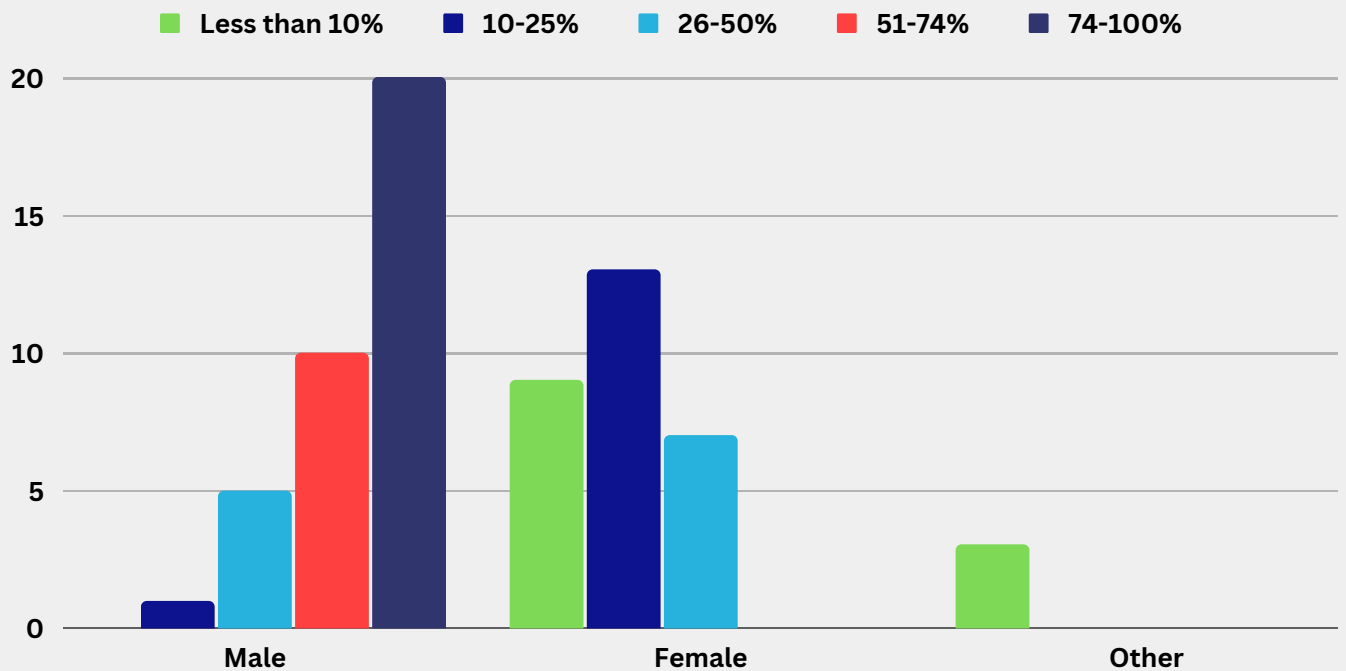
# Results of Information and Data Collection

## Workforce Diversity

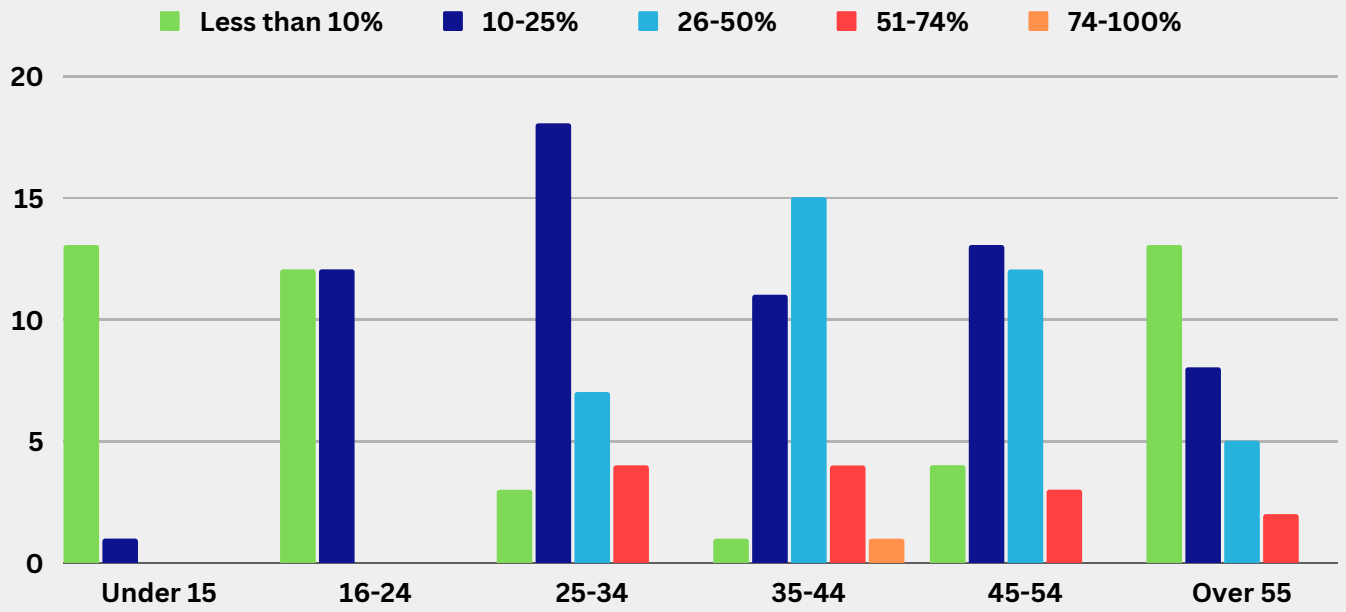
Looking across the workforce data collected, we find the following:

- Over 80% of companies indicated that their workforce is more diverse than 5 years ago and over 50% of companies indicated that diversifying their workforce is a major priority.
- The greatest change is the increase in the number of women in the workforce. For example, one company indicated that they have increased the number of women in the technical workforce by 10 in the past 2 years.
- Hires have also increased in the number of people of color and those with disabilities, veterans, refugees, and a history of incarceration.

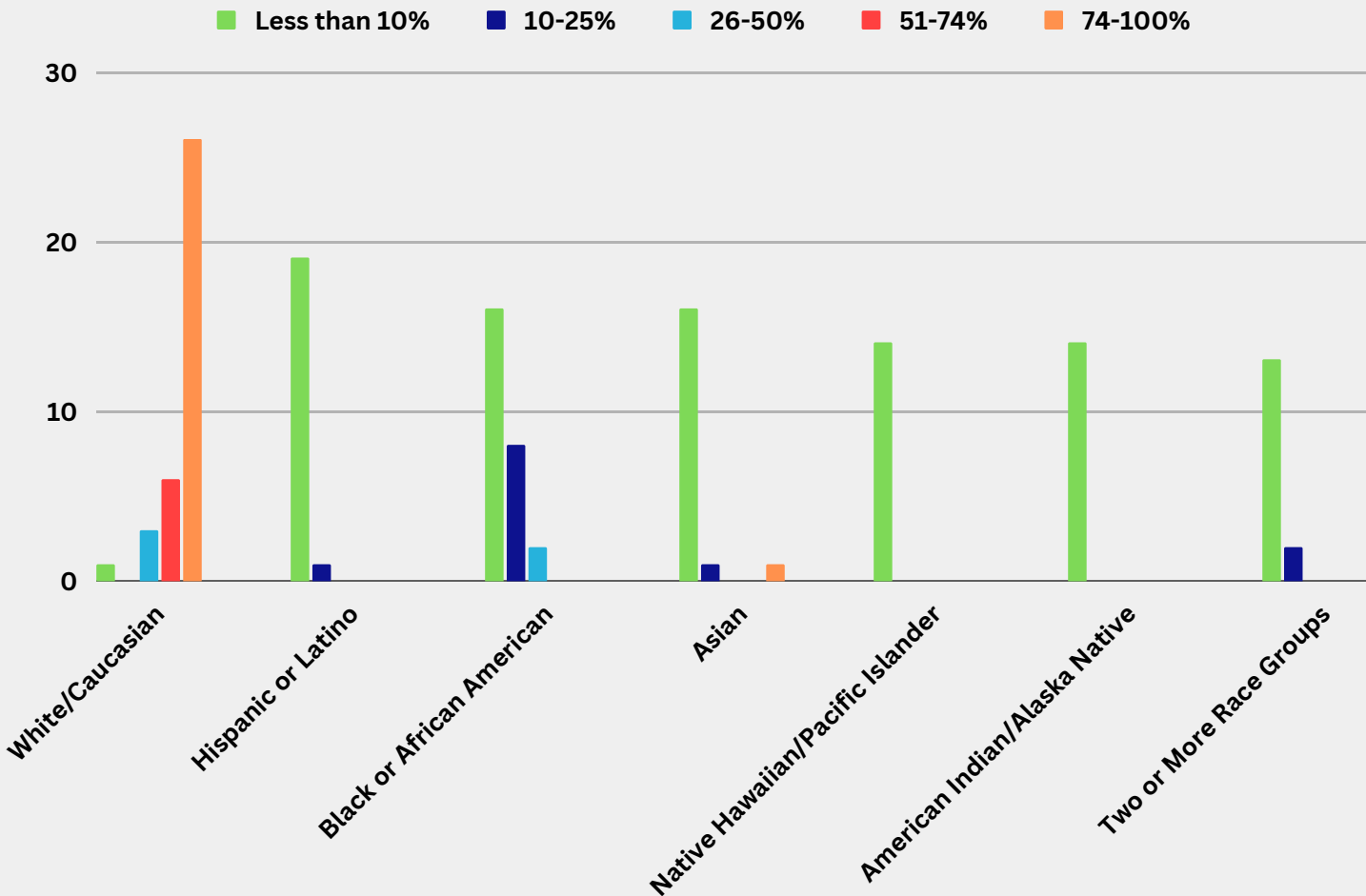
What percentage of your technical workforce is:



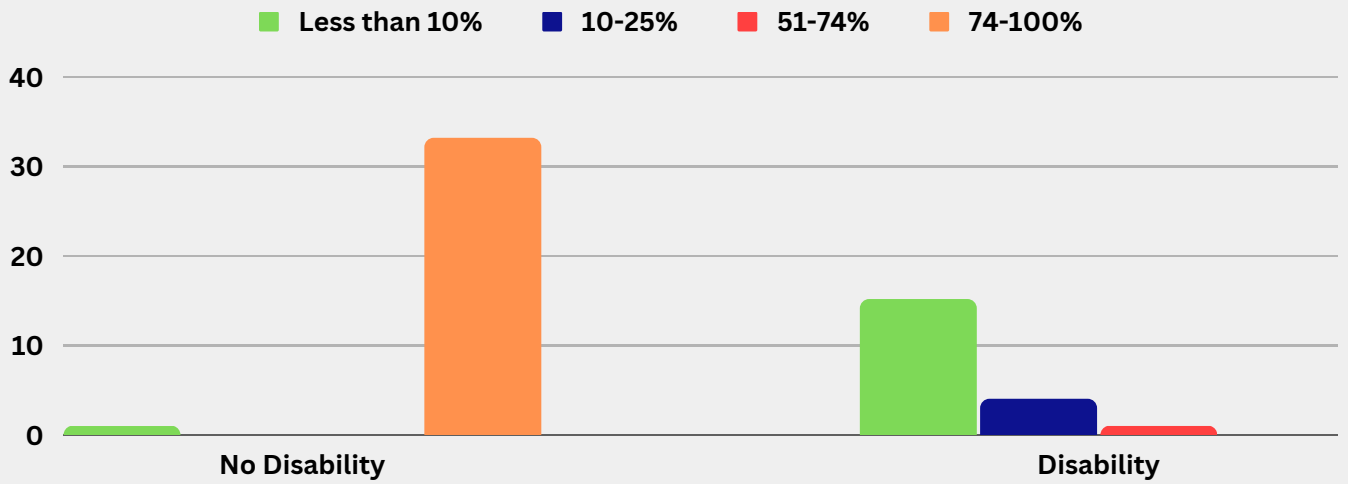
### What percentage of your technical workforce is:



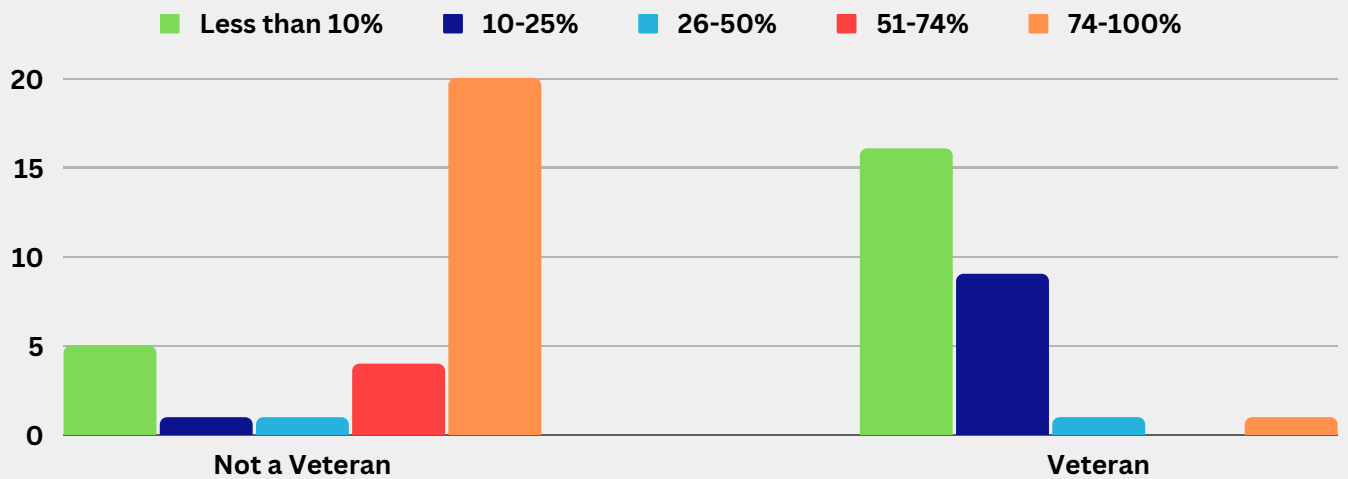
### What percentage of your technical workforce identifies with the following race/ethnicity:



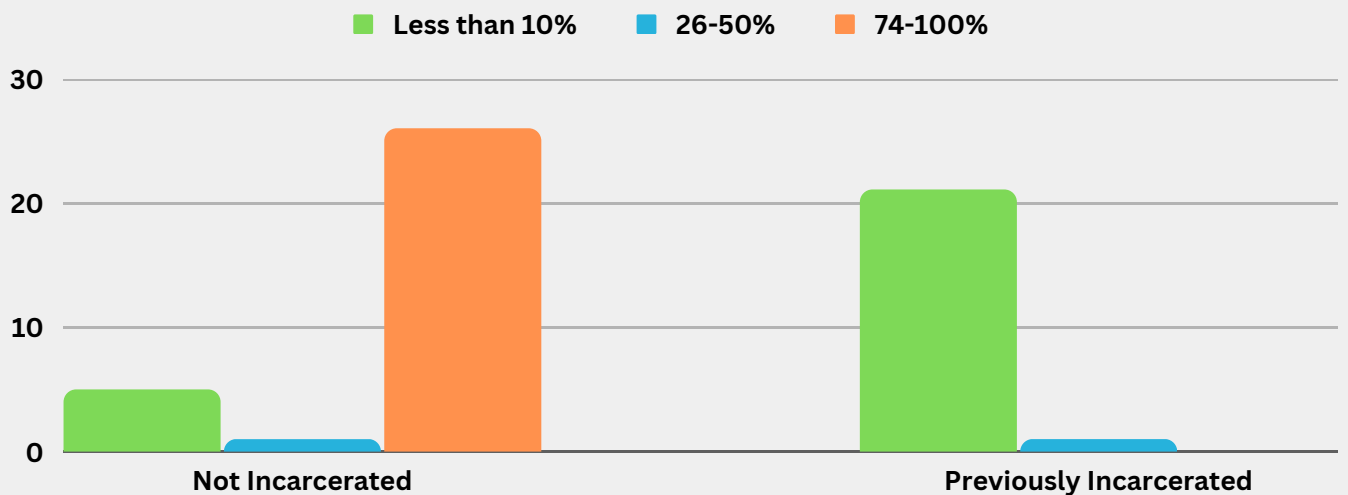
### What percentage of your technical workforce identifies with the following disability status?



### What percentage of your technical workforce identifies as a veteran?



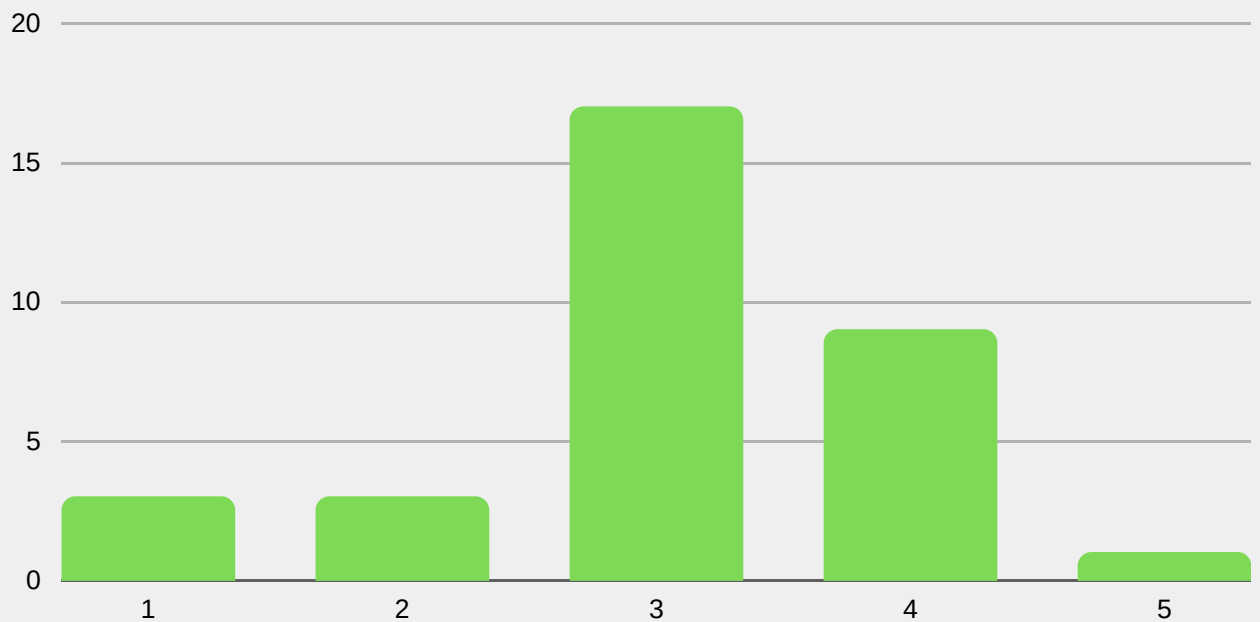
### What percentage of your technical workforce has previously been incarcerated?





## How would you assess the change in diversity of your workforce over the past 5 years?

33 responses

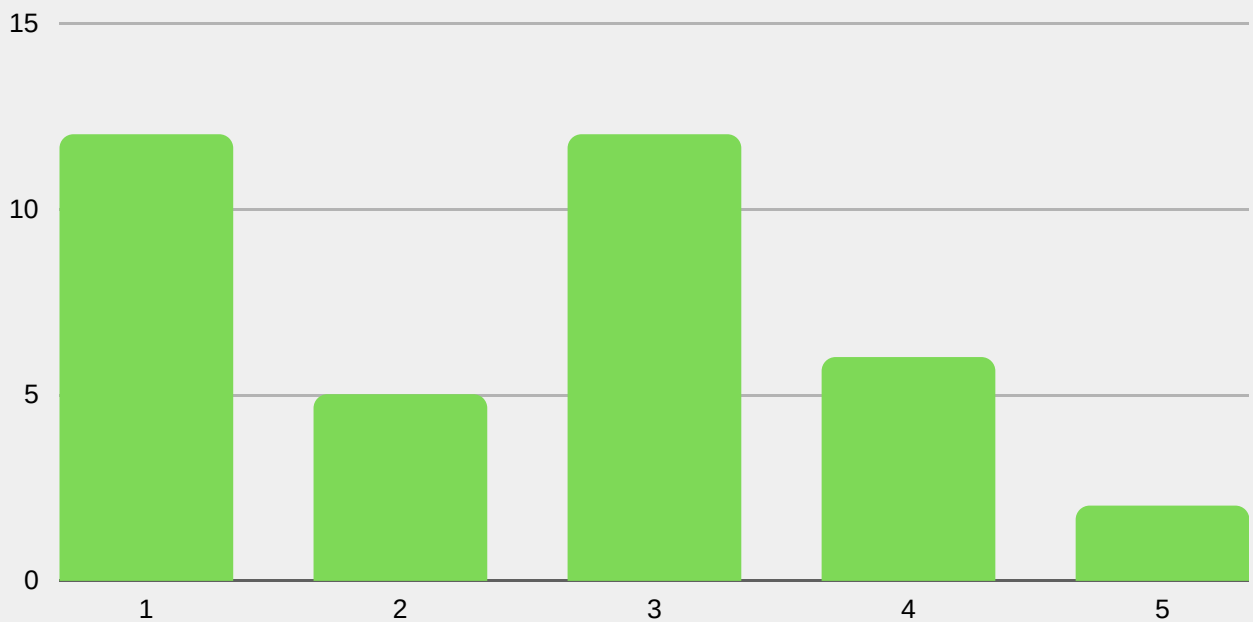


### Respondents (quoted) were asked to describe the change in diversity in their company, if any:

- "No real changes in our diversity levels."
- "Steadily growing but our numbers match the numbers of surrounding areas"
- "Disadvantage peoples need help more."
- "More women hired."
- "We have hired more diverse applicants who quit or were terminated for attendance issues."
- "Higher percentage of women"
- "More women, more people of color."
- "There's been no change."
- "We now have 10 females here which is more than we have had in the last two years I have been here!"
- "We have a lot of people retiring and our priority is succession planning, but the graduating generation has a different mindset."
- "Larger applicant pool of female or minority candidates."
- "Male to female ratio has increased from three females to sixteen."
- "No change."
- "We use to have women printing for us."
- "Have hired trans, refugees and continue to maintain a diverse workforce."
- "More females."

## To what degree is your company actively seeking to diversify its workforce?

37 responses



### Respondents (quoted) were asked what activities, if any, their company is undertaking to diversify its workforce:

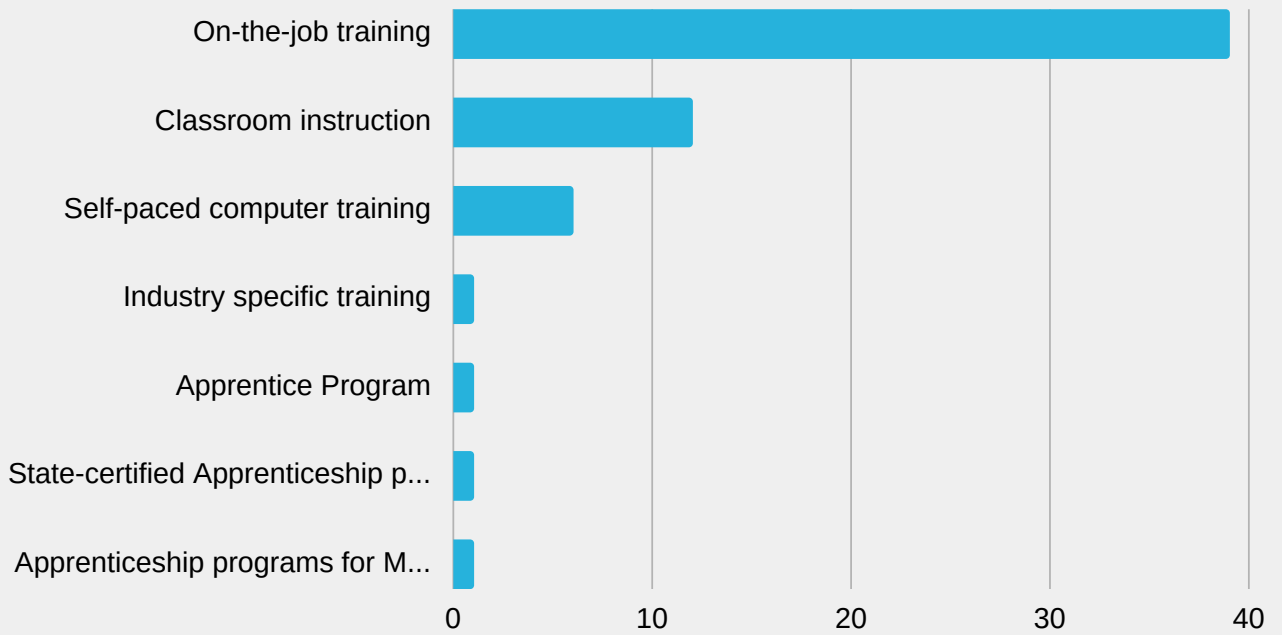
- "We will hire anyone who will show up for work."
- "New recruiting pools and methods."
- "Word of mouth."
- "Using multiple sourcing options."
- "EEO employer to anyone that wants to apply."
- "We are hiring an HR person."
- "Employee Resource Groups have been rolled out as part of a corporate DE&I program."
- "None."
- "We are teaching DE&I training to all employees and we have reached out to numerous organizations for assistance."
- "Our company would not discriminate; diversity would not be an issue"
- "School Programs, Training on DEI in the workforce."
- "We hope to talk to the students at the local high schools and technical schools to give them an understanding of our business for both boys and girls."
- "Our community is not very diverse."
- "We are having problems finding any applicants."
- "Hire by who is qualified for the position."

# Results of Information and Data Collection

## Training Expectations and Needs

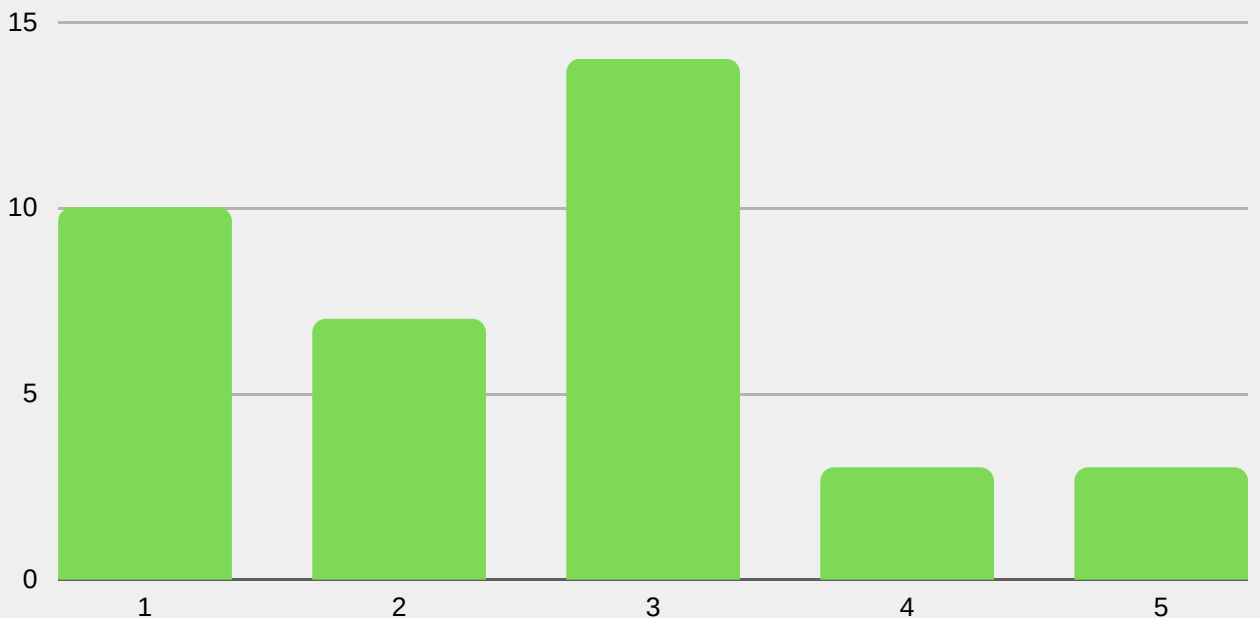
**What internal training do you currently provide to your entry-level workers? (More than one may be picked)**

39 responses



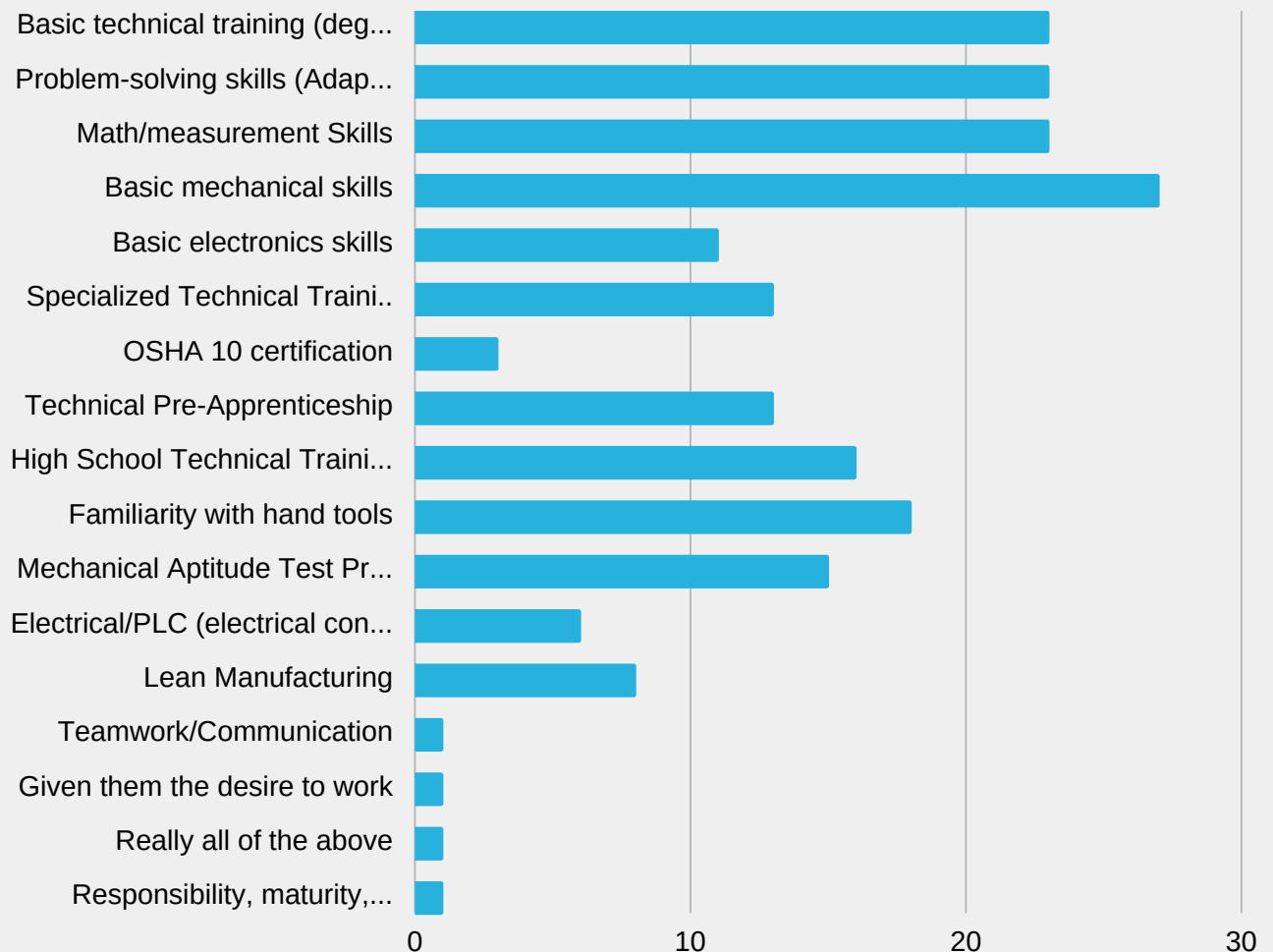
**How important is pre-employment training in your hiring process for entry-level workers?**

37 responses



## What technical training would make you more likely to hire someone at the entry-level who has no or limited previous work experience? (More than one can be checked)

39 responses



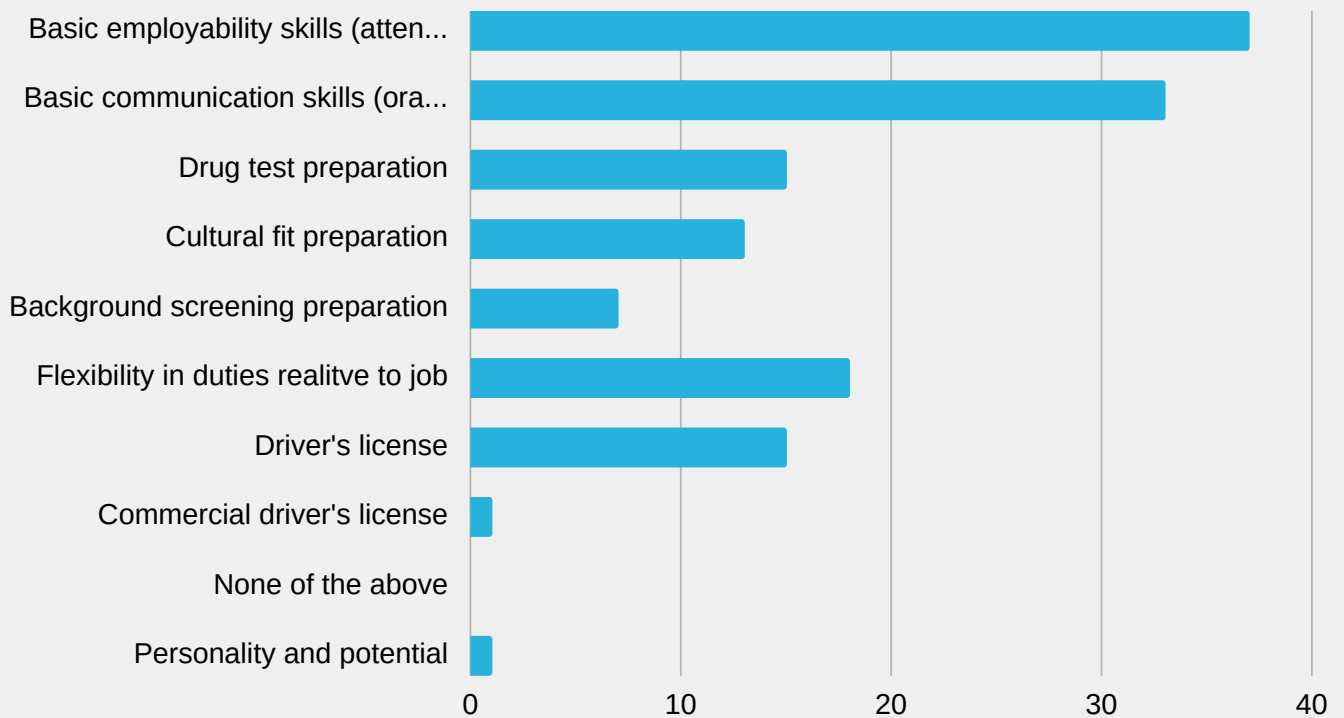
**For specialized training needs, most companies were interested in CNC machine training. Some specific comments about that training include:**

- "Self-motivated courses with decision-making"
- "It would be a huge benefit if someone had experience in drawing, and operating that equipment. Most places that fabricate have some sort of CNC equipment that it would benefit young workers to know how they operate, at the least, and to operate them would be even better."
- "Grinding and Programming"
- "Basic knowledge in CNC programming, having an understanding of it and knowing enough to learn to the next level"
- "2-5 years of CNC training"

One was also interested in IPC certification and another in 2 years of welding training.

## What soft skills training would make you more likely to hire someone at the entry-level who has no or limited previous work experience? (More than one can be checked)

39 responses



**Respondents were asked what pre-employment training other than those identified in the previous question would increase the chances that the company would hire an applicant. Comments (quoted) include:**

- *"Reliable"*
- *"Electrical & mechanical assembly"*
- *"Always self-prepared online courses for measurements and other related skills"*
- *CNC machine experience."*
- *"Basic employability, basic math, coping skills, and openness to night shift work"*
- *OSHA 30-hour class, LEAN training, Some sort of root cause elimination course"*
- *basic math skills."*
- *"Basic computer skills, communication"*
- *"Soft skills training, how to interview, communication skills."*
- *"Ability to separate personal matters from employment performance."*
- *"Certificates in lean, problem solving, or leadership."*
- *"Positive attitude during the interview."*
- *"Math is important in our business."*
- *"Accountability training"*
- *"GMP For Food, ServSafe, HACCP"*

Another question respondents were asked was the biggest challenge they faced in training their current workforce.

- Most respondents noted time and money.
- An illustrative comment for many was “***Finding time to take them off the floor and labor cost of taking them off the floor***” --particularly when companies are short-staffed.
- **Related issues were:**
  - Insufficient funding available for training
  - Finding good trainers
  - The need for training the trainers
  - Insufficient detail in a general training program relative to the company’s needs. For example, on-the-job training with an experienced worker is more useful than having a set training curriculum as well as a training program that is specific to their industry.



## Final Thoughts

Respondents were asked if they had any final thoughts, suggestions or comments for the survey as a whole. Comments included the following:

- *"Small business needs more financial help."*
- *"We appreciate the Catalyst group as they are very helpful and attentive to our needs. Catalyst has helped train every person in the work force at [our company]. We all want to standardize, and all have the same training, so we all speak the same language. Great people to work with and always accommodating to changing conditions."*

## Appendix: Participating Companies

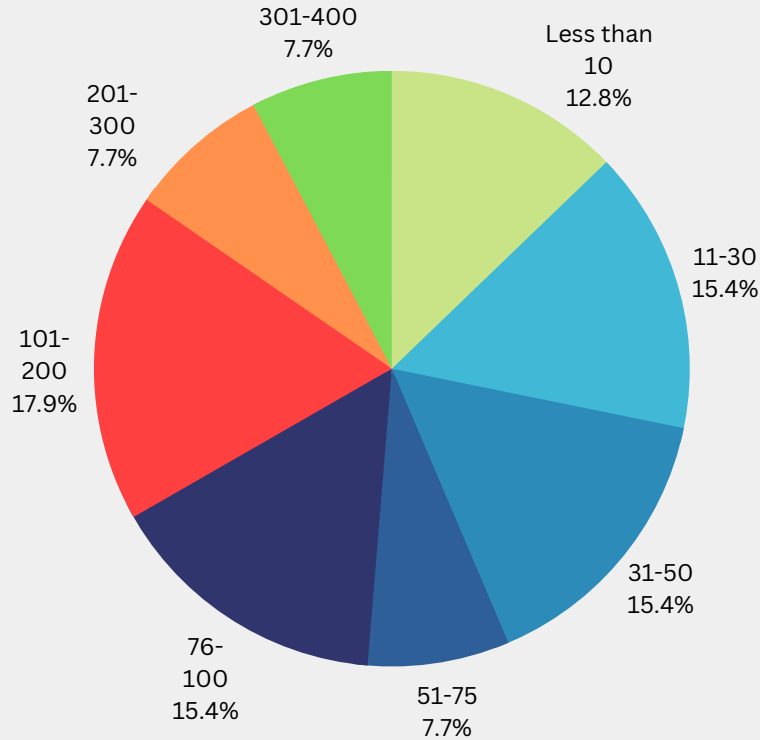
Catalyst Connection would like to sincerely thank the following Southwest Pennsylvania companies that took time out of their busy schedules to participate in the survey, interviews, and focus groups that provided the data for this report.

5 Generation Bakers	Global Incorporated
A. Pepper Designs, Inc	Intervala, LLC
Accutrex Products	J.V. Manufacturing
Acuity Finishing	JADCO Manufacturing, Inc.
Acutran	Jodat Technologies Co. Inc,
Alpine Packaging, Inc.	Keystone Manufacturing Inc
Angstrom Sciences, Inc.	L & S Machine Company, llc
Aquatech International	Mancini's Bakery Inc
Ardex Americas	Markaloy Mfg. Co., Inc.
BCI Steel	O'Neal Manufacturing Services
Better Edge	Product Evaluation Systems, Inc.
Center Rock Inc	ProFab Solutions
ChemDAQ, Inc.	PTC Alliance
Clark Metal Products	Schroeder Industries
Creekside Springs, LLC	Stellar Precision Components
Cygnus Manufacturing Company	Tronix3D
DJ Machining, LLC	W.G. TOMKO, INC.
DMI Companies	WE-EF Lighting
Drive DeVilbiss Healthcare	ZOLL
Du-Co Ceramics Company	

***Additional information about the companies responding to the survey is provided below.***

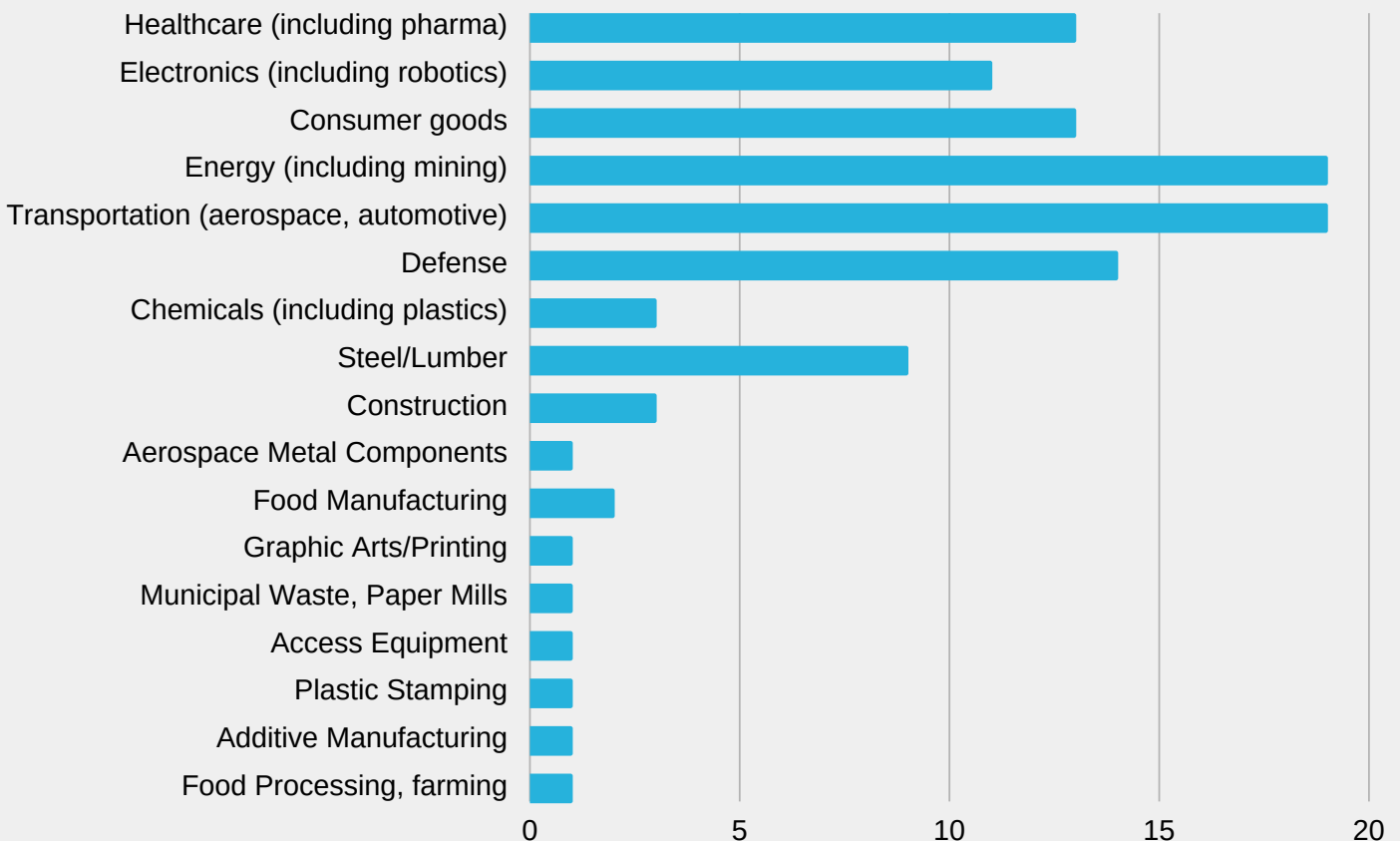
**How many people are employed by your company in your Southwest PA locations?**

39 responses



**For what sectors does your company produce products? (More than one may be checked)**

39 responses





## **About Catalyst Connection**

Catalyst Connection is a private not-for-profit organization headquartered in Pittsburgh, Pennsylvania. We provide consulting and training services to small manufacturers in southwestern Pennsylvania, accelerating revenue growth and improving productivity.

Through active collaboration with our clients and the manufacturing community, we contribute to the growth, vibrancy, and ongoing robustness of manufacturing in our region.

Catalyst Connection is supported, in part, by the Commonwealth of Pennsylvania, Department of Community and Economic Development, and by the National Institute of Standards and Technology's Hollings Manufacturing Extension Partnership.

## **About The Science and Technology Policy Academy**

Dr. Deborah D. Stine is the Founder of the Science & Technology Policy Academy. The Academy offers on-demand and live classes, workshops for organizations, executive coaching, and “done for you” policy analysis, program evaluation, and policymaker and public communication services.

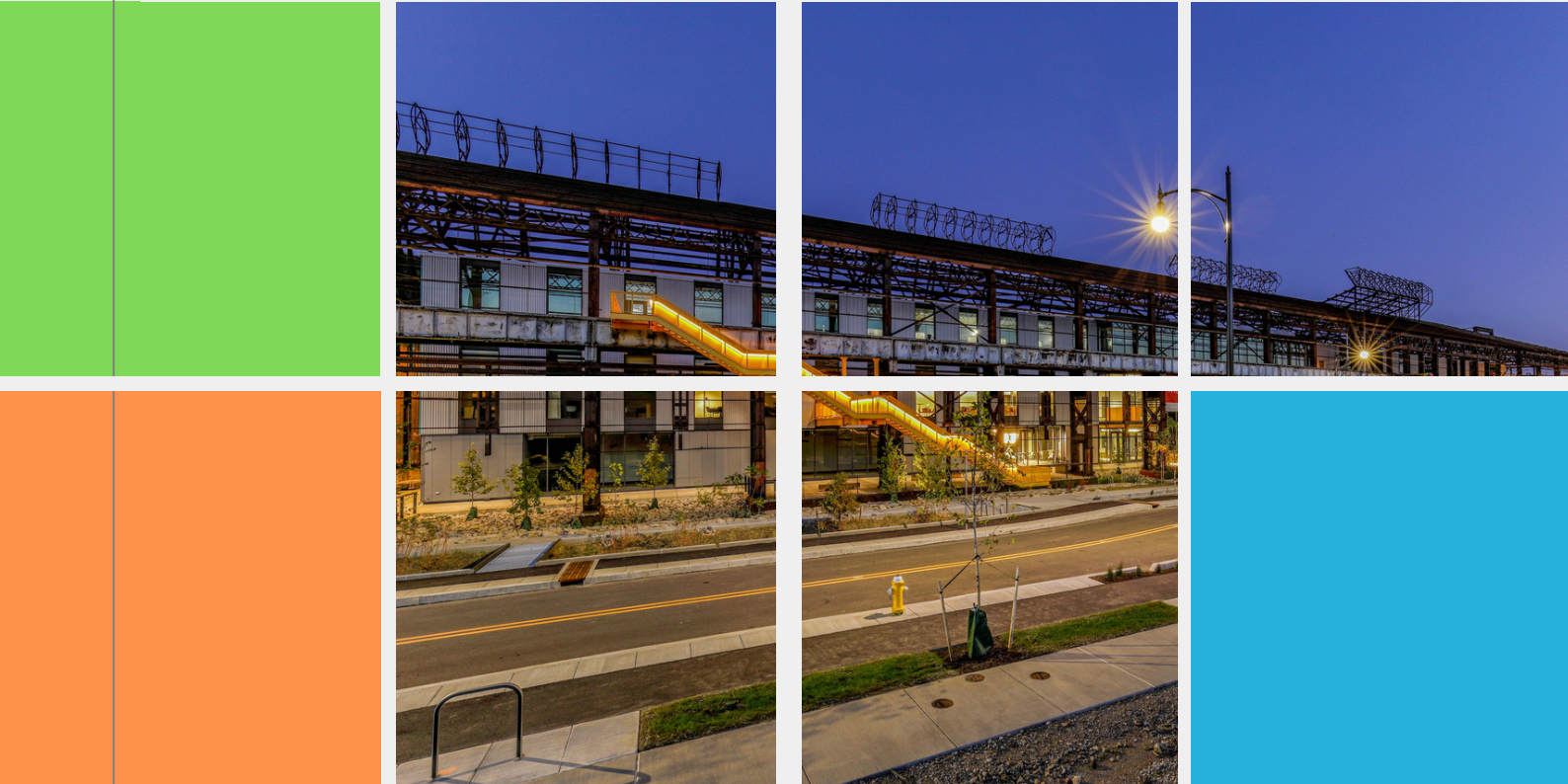
## **About the Appalachian Regional Commission**

The Appalachian Regional Commission (ARC) is an economic development partnership entity of the federal government and 13 state governments focusing on 423 counties across the Appalachian Region. ARC's mission is to innovate, partner, and invest to build community capacity and strengthen economic growth in Appalachia.


ARC invests in Appalachia's economic future by providing grants, publishing research, and sponsoring learning experiences – all to help the Region's communities seize their opportunities, address economic disparity and advance prosperity.





# Thank You




This publication is produced by Catalyst Connection, The Science and Technology Policy Academy, and The Appalachian Regional Commission. For informational purposes only and is intended to provide an overview of the subject matter addressed. It is provided on the basis that Catalyst Connection, The Science and Technology Policy Academy, and The Appalachian Regional Commission have not been engaged in rendering legal services or providing legal advice. If you require legal advice, please seek the services of an attorney

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