

# SPARKFORCE™

THE **FMA** FOUNDATION



## Summer Manufacturing Camp Program Impact Study Update

EVALUATING SPARKFORCE SUMMER MANUFACTURING CAMPS 2021-2025



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# Executive Summary

## Program Background

SparkForce®, a 501c3 nonprofit organization, is the charitable foundation of the Fabricators and Manufacturers Association (FMA). Formerly known as Nuts, Bolts & Thingamajigs (or NBT), the organization became SparkForce, The FMA Foundation, on January 1, 2025, continuing its mission and all previous programming under the new name. Their mission is to inspire, attract, and support individuals in discovering their interest in manufacturing and to encourage the pursuit of a manufacturing career.

For over 20 years, SparkForce has maintained a focus on developing the next generation of manufacturers through their flagship program, Summer Manufacturing Camps. Summer Manufacturing Camps target youth, aged 12 to 16, with the goal of exposing them to manufacturing career options at an early age. SparkForce believes that they can influence future educational choices and career decisions by reaching students at a young age when they are most impressionable. Summer Manufacturing Camps offer unique opportunities for younger students to explore the world of manufacturing through engaging, hands-on learning experiences in which they learn teamwork and leadership skills that are vital to their long-term success in a manufacturing career.

## Key Findings

This report highlights a five-year impact evaluation of SparkForce's Summer Manufacturing Camps, specifically, programs held in 2021 through 2025 and is a follow up to the initial impact study on the camps program published in 2020. A mixed-methods evaluation approach, using both quantitative and qualitative data, was taken to evaluate the impact of the camps on camp participants' knowledge, awareness, and acquisition of new skills. The findings presented in this report comprise survey data collected from camp participants and camp hosts.



Key findings include:

- **Camp participant impact has remained consistent for over a decade of evaluation.**
  - Post-camp surveys show significant increases in participants' awareness of and interest in manufacturing careers.
  - Participants reported greater understanding of local manufacturing jobs, and the training needed for such careers.
  - Post-camp survey data demonstrated substantial growth in hands-on manufacturing skills such as designing and constructing products using CAD software, tools, and machines.
  - Camps encouraged participants to connect with local manufacturing employers and colleges and pursue CTE courses, extracurricular clubs, or technical degrees.

- **Summer Manufacturing Camps facilitate camp host and industry partnerships that in turn benefit local communities.**
  - 93% of camp hosts reported that by hosting camps, they improved their organization's image in the community.
  - 84% of camp hosts reported they built or strengthened partnerships with local manufacturers.
  - Many camp hosts reported ongoing collaborations with local manufacturers to support the next generation's workforce development efforts.
  
- **SparkForce's scale-up expansion efforts of their Summer Manufacturing Camp succeeds and demonstrates the sustainability of the program.**
  - From 2021-2025, SparkForce more than doubled the number of Summer Manufacturing Camps nationwide compared to the previous five-year period.
  - Roughly two-thirds (67%) of camp host sites were repeat hosts, indicating strong sustainability and satisfaction with implementing the program.
  
- **SparkForce supports programmatic growth and sustainability through continuous quality improvement.**
  - In the last five years, SparkForce has strengthened its internal evaluation systems, staff capacity, and data collection tools.
  - SparkForce staff continue to embed program evaluation and data-driven improvements into its organizational culture.

## Recommendations

The recommendations presented below offer ways SparkForce can maintain efforts to sustain their program evaluation system and measure longer-term impacts of Summer Manufacturing Camps.

- **Continue to embed program evaluation into SparkForce's organizational culture.**
- **Continue to explore ways to gather and analyze data on the manufacturers who engage with SparkForce Camps and their perceptions of the Camp program's impact on the industry.**
- **Consider ways to evaluate longer term impact of camps through small research studies.**

As SparkForce strengthens its commitment to program evaluation and continuous quality improvement, it ensures that it will continue to increase the number of people pursuing educational and career pathways related to manufacturing and, ultimately, working in manufacturing environments.



## Identifying the Problem and SparkForce's Mission

A recent report from Deloitte and The Manufacturing Institute estimates that manufacturing in the U.S. will continue to grow, 3.8 million jobs will be created by 2033, and 1.9 million jobs will go unfilled due to lack of applicants and skilled workers.<sup>1</sup> The talent crisis will only get worse as 20% of manufacturing workers will retire in the next decade and there is not a pipeline of labor with the right skills to replace them. To ensure manufacturing in the United States meets demands, the industry needs a strong workforce that is prepared to keep pace with advances in technology. A lack of skilled workers could cost the U.S. economy up to \$1 trillion annually if the manufacturing skills gap is left unaddressed.<sup>2</sup>

The manufacturing industry suffers from an outdated and negative perception that is reflected in the public. A recent study from YouScience reported that students in high school have more than three times the aptitude for advanced manufacturing careers than interest in a manufacturing career.<sup>1</sup> There is a lack of exposure to manufacturing careers for middle and high school students, their parents, teachers, and guidance counselors. Studies on interventions like Manufacturing Day show that even a one-day event can change youths' perceptions of manufacturing significantly and in a positive direction.<sup>2</sup> More opportunities for intervention are needed to expand the impact of these changes to youths' perceptions about manufacturing and the long-term potential for careers in manufacturing.

SparkForce's mission of inspiring, attracting, and supporting individuals in discovering an interest in manufacturing is central as it helps address these challenges by inspiring and preparing the next generation of manufacturing talent through their programs. Its Summer Manufacturing Camps introduce young people and adults to real-world manufacturing through hands-on learning, teamwork, and leadership experiences that build confidence and essential skills. These camps increase awareness and interest in manufacturing pathways and ultimately help to strengthen the pipeline of individuals pursuing technical training and long-term careers in the industry.

## Overview of SparkForce's Summer Manufacturing Camps

SparkForce believes that by reaching students at a young age, youth are provided with more opportunities to explore career decisions. Their Summer Manufacturing Camps target youth ages 12 to 16 with the goal of exposing them to manufacturing career options at an early age.

SparkForce provides grant funding, material support, and a five-section entrepreneurship curriculum to camp hosts implementing Summer Manufacturing Camps. Developed in partnership with the National Association for Community College Entrepreneurship (NACCE), the SparkForce Camp curriculum is designed to help instructors lead students through the manufacturing process by following a product idea from its original concept development to design (using CAD software) to production (using machines and equipment) and, finally, to its introduction in the marketplace. The curriculum helps instructors apply the concepts to their camp's project, and along the way, students are exposed to an array of manufacturing career possibilities.

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<sup>1</sup>YouScience (2021) State of the Future U.S. Workforce: Student Ability Report. Retrieved from: [https://resources.youscience.com/rs/806-BFU-539/images/2022\\_StudentAbility\\_Report.pdf](https://resources.youscience.com/rs/806-BFU-539/images/2022_StudentAbility_Report.pdf)

<sup>2</sup>Strimel, G., Krause, L., & Serban, S. (2020) Children's Perceptions of Manufacturing Careers: Examining the Influence of Industry-Public Education Initiative. Retrieved from: <https://peer.asee.org/children-s-perceptions-of-manufacturingcareers-examining-the-influence-of-industry-public-education-initiatives>

SparkForce Summer Manufacturing Camps offer unique opportunities for younger students to explore the world of manufacturing through hands-on learning experiences, and the program has grown tremendously over the past two decades. The expansion of SparkForce camps across the country indicates how successful they are at introducing middle school and high school students to manufacturing and the career choices available today in the industry. From 2004 through 2025, SparkForce provided over \$3.34 Million in grant funding, supporting 1,673 camps, and impacting more than 25,700 young people in 43 U.S. states.

## Literature Review and Best Practices

Decades of research have proven that early exposure to career pathways in the middle school stage (ages 12-15) is critical to successful career development.<sup>3,4,5</sup> While most states in the U.S. value early career exploration in middle school and have dedicated funding and requirements for middle school career exploration written as policy, few states measure the quality of the programming or provide schools and districts with capacity-building support (i.e. training, resources, curriculum, and implementation guidance) needed to carry them out.<sup>6</sup> As a result there is great variability in the type of career exploration curriculums provided across states and many students express that they do not get enough hands on experiences to explore careers in school.<sup>7,8</sup>



There are no formal statistics for how many of the 14,677 middle schools in the U.S. offer career and technical education (CTE) courses. Recent reports at the high school level show an increased interest in CTE courses and at the same time a shortage of teachers who are trained to teach CTE.<sup>9</sup> It is speculated that a CTE teacher shortage is occurring at the middle school level as well.

Programs like SparkForce's Summer Manufacturing Camp are working to fill the gap by supporting the creation of fun and engaging camps that raise middle school youth's awareness of manufacturing careers, while also building skills that will prepare them for employment. The camps incorporate best practices for middle school CTE such as conveying STEM concepts through project-based learning, job shadowing and/or tours at local manufacturing companies, and guest speakers or panels for camp participants to learn about specific careers from people that work in the industry.

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<sup>3</sup>Super D. E. (1990). "A life-span, life space approach to career development" in Career choice and development theories to practice. eds. Brown D., Brooks L., et al. (San Francisco, CA: Jossey-Bass; ), 197-261.

<sup>4</sup>Godbey, S., & Gordon, H. R. (2019). Career exploration at the middle school level: Barriers and opportunities. Middle Grades Review, 5(2), 2.

<sup>5</sup>Porfeli, E. J., & Lee, B. (2012). Career development during childhood and adolescence. New directions for youth development, 2012(134), 11-22.

<sup>6</sup>American Student Assistance & Education Strategy Group (2024) Extending the Runway: A National Analysis of Middle School Career Exploration. Retrieved from: <https://www.asa.org/wp-content/uploads/2024/02/ASA-Extending-the-Runway-022924.pdf>

<sup>7</sup>Education First (2022) Redesigning Middle School CTE Pathways. Retrieved from: <https://delawarepathways.org/wpcontent/uploads/2024/03/Literature-Review.pdf>





<sup>8</sup>Ibid.

<sup>9</sup>Heubeck, E. (January 24, 2025) CTE Grows in Popularity Among Students, But Teachers are Tough to Find, Education Week. Retrieved from: <https://www.edweek.org/leadership/cte-grows-in-popularity-among-students-but-teachers-are-tough-to-find/2025/01>

# Evaluation Design and Methodology

## Evaluation Evolution, Theory of Change, and Impact Study Measures

Since publishing the previous impact study, SparkForce has expanded its program department and strengthened the integration of program evaluation into daily operations. In the last two years, SparkForce has added two full-time staff members who oversee program implementation and manage data collection to support ongoing evaluation

<p><b>What is the problem that you are trying to solve?</b></p> 	<p><b>What steps are needed to bring about change?</b></p>  	
<p>According to industry studies, manufacturing will continue to grow over the next decade and nearly 1.9 million jobs could go unfilled in the US<sup>14</sup>.</p> <p>A recent study from YouScience reported that students in high school have more than three times the aptitude for advanced manufacturing careers than interest in a manufacturing career<sup>15</sup>.</p> <p>There is a lack of exposure to manufacturing and manufacturing careers for middle and high school students, their parents, teachers, and guidance counselors.</p> <p>Studies on interventions like Manufacturing Day, show that even a one-day event can change children’s perceptions of manufacturing significantly and in a positive direction<sup>16</sup>. More interventions are needed to change youths’ perceptions about manufacturing.</p> <p style="text-align: center;"></p> <p><b>Who is your key audience and entry point to reaching them?</b></p> <p>The target audience is middle- and high-school students. <b>Reach them through:</b></p> <ul style="list-style-type: none"> <li>▪ Parents and families</li> <li>▪ Teachers</li> <li>▪ Camp directors</li> <li>▪ Community college/tech schools and universities</li> </ul>	<p>Develop a sustainable financial structure with diversified funding sources</p> <p>Deepen relationships with educational institutions that have a manufacturing focus</p> <p>Develop partnerships with educational institutions to deliver SparkForce summer camp curriculum and promote manufacturing scholarships</p> <p>Create high-quality program infrastructure and ensure that our educational partners provide developmentally appropriate teaching strategies, appropriate manufacturing resources and equipment, and pedagogical tools to best serve students</p> <p>Expose students to manufacturing career paths that may include CTE programs at camp hosts’ schools</p>	<p><b>Summer Manufacturing Camps contain:</b></p> <ul style="list-style-type: none"> <li>▪ Hands-on learning</li> <li>▪ Visits to manufacturing facilities</li> <li>▪ Meet with manufacturing professionals</li> <li>▪ Skill development. For example: basic machining, fabrication, welding, 3D printing, or additive manufacturing</li> </ul>

<sup>14</sup> John Coykendall, Kate Hardin, John Morehouse, Victor Reyes, and Gardner Carrick, “Taking charge: Manufacturers support growth with active workforce strategies,” Deloitte Insights, April 3, 2024.

<sup>15</sup> YouScience (2021) State of the Future U.S. Workforce: Student Ability Report. Retrieved from: [https://resources.youscience.com/rs/806-BFU-539/images/2022\\_StudentAbility\\_Report.pdf](https://resources.youscience.com/rs/806-BFU-539/images/2022_StudentAbility_Report.pdf)

efforts. SparkForce staff have developed processes to review program evaluation tools and each program’s theory of change on an annual basis to ensure all tools and theories of change are aligned with current metrics and organizational terminology. As such the theory of change for the Summer Manufacturing Camp program was revised to reflect SparkForce’s overall goal and problem it is trying to solve. **(see below)**

<p><b>What is the measurable effect of your work to increase the number of students pursuing education and careers in manufacturing? (Short-term outcomes)</b></p>	<p><b>What are the wider benefits of your work for this population? (Mid-term outcomes)</b></p>	<p><b>What is the long-term change you see as your goal? (Long-term outcomes)</b></p>
<p>By the end of a SparkForce camp:</p> <ul style="list-style-type: none"> <li>▪ Camp participants increase their awareness of STEM and CTE courses that prepare them for careers in manufacturing</li> <li>▪ Camp participants build skills in basic machining, fabrication, welding, 3D printing or additive manufacturing</li> <li>▪ Camp participants increase their awareness of the entrepreneurial aspects of manufacturing</li> <li>▪ Camp participants are aware of the careers in manufacturing and courses and degrees/ certifications offered at camp host college</li> </ul>	<p>After attending a SparkForce camp:</p> <ul style="list-style-type: none"> <li>▪ Camp participants select STEM and CTE courses in middle or high school and/or engage in other related activities (e.g., robotics clubs)</li> <li>▪ Camp participants take electives or dual-credit courses in high school that further their hands-on skill building (e.g. welding, 3D printing, etc.)</li> <li>▪ Camp participants enroll in colleges, technical colleges, trade schools, or universities and major in a field of study that is related to manufacturing</li> <li>▪ Camp participants graduate from colleges, technical colleges, trade schools, or universities and major in a field of study that is related to manufacturing</li> </ul>	<p>The ultimate goal of SparkForce is to increase the number of people who pursue career pathways related to manufacturing and work in manufacturing environments.</p>

<sup>16</sup> Strimel, G., Krause, L., & Serban, S. (2020) Children’s Perceptions of Manufacturing Careers: Examining the Influence of Industry-Public Education Initiative. Retrieved from: <https://peer.asee.org/children-s-perceptions-of-manufacturing-careers-examining-the-influence-of-industry-public-education-initiatives>

The table below (Table 1) describes the measurements used in the impact study, respondent groups, and the number of respondents per group during this time period (2021-2025).

**TABLE 1: SPARKFORCE IMPACT STUDY MEASUREMENTS**

<b>Evaluation Tool Name</b>	<b>Respondent Type</b>	<b>Number of Respondents</b>
Pre- and Post-Camp Participant Survey	Camp Participants	10,076 (pre) / 8,121 (post)
Camp Host Final Evaluation Report	Camp Hosts	1,033

This impact study focused on short-term outcomes such as raising awareness of manufacturing careers in camp participants and helping camp hosts build or strengthen relationships with local manufacturers. Table 2 outlines evaluation measurements, corresponding indicators, and methods of analyses used for the study.

**TABLE 2: SPARKFORCE IMPACT STUDY MEASUREMENTS, CORRESPONDING INDICATORS, AND METHODS OF ANALYSIS**

<b>Evaluation Tool Name</b>	<b>Indicators</b>	<b>Method of Analysis</b>
Pre/Post Camp Participant Surveys	<ul style="list-style-type: none"> <li>▪ % of participants that raised their awareness of and interest in manufacturing careers</li> <li>▪ % of participants that developed new skills related to manufacturing</li> <li>▪ % of participants that raised their awareness of the types of manufacturing jobs in their community.</li> <li>▪ % of participants that raised their awareness of the training needed for a future manufacturing career</li> </ul>	Quantitative analysis
Camp Host Final Evaluation Reports	<ul style="list-style-type: none"> <li>▪ % of camp hosts affirming new or strengthened relationships with local manufacturers</li> <li>▪ % of camp hosts promoting manufacturing careers</li> </ul>	Quantitative analysis
	<ul style="list-style-type: none"> <li>▪ camp's impact on local manufacturing community</li> <li>▪ examples of how camp hosts strengthened relationships with local manufacturing community</li> <li>▪ student outcomes (success stories)</li> </ul>	Qualitative analysis

For this impact study, a mixed-methods approach was used, utilizing both quantitative and qualitative data to examine the impact Summer Manufacturing Camps had on camp participants' awareness, knowledge and acquisition of new skills. Quantitative survey data collected from camp participants and camp hosts over the five-year period was analyzed to find out to what extent the Summer Manufacturing Camps achieved short and mid-term outcomes. Open-ended survey questions were qualitatively analyzed to provide context and add rich insights to quantitative findings. The mixed-method study aimed to answer the following evaluation questions:

1. To what extent do SparkForce manufacturing camps raise camp participants' awareness of careers in manufacturing?
2. To what extent do SparkForce camp participants continue to pursue a skill or interest that they learned in camp by taking a CTE or dual-credit course in high school?
3. To what extent do SparkForce camp participants apply to, are accepted in, and graduate from manufacturing-related programs?
4. How valuable are the manufacturing camps for the participating camp hosts? What works best for whom, under what conditions, and why/how?



## Qualitative Analyses

Camp participants and camp hosts completed surveys with both quantitative and qualitative questions via Qualtrics, an online survey management system. SparkForce staff downloaded and cleaned each dataset (e.g. checked for and removed any errors in data entry, such as duplicate responses). The Evaluation Consultant conducted descriptive analyses (e.g. frequencies and percentages) of individual survey items pertinent to the evaluation questions.

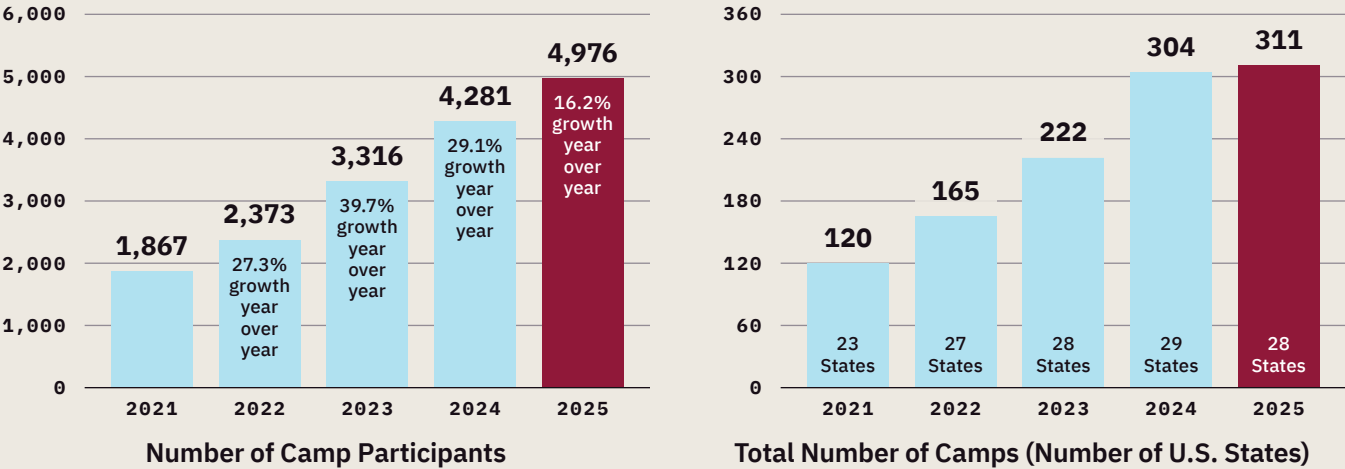
Open-ended survey questions were qualitatively analyzed in Excel via an iterative process, which resulted in two cycles of analyses: (1) pattern, and (2) conceptual model building. A categorized inventory of the open-ended survey questions' content was conducted and set the groundwork for thematic analysis. Pattern coding was used to organize thematic patterns that describe phenomena in the qualitative data that relate to specific evaluation questions. Following pattern coding, the Evaluation Consultant developed conceptual models by linking themes and emergent codes generated from the first cycle of analysis to create a higher-level understanding about the impact of SparkForce's camps on camp participants, camp hosts, and the local manufacturing industry.



# SparkForce's Manufacturing Camp Growth and Sustainability

SparkForce’s visibility and notoriety continues to attract more interest and demand for their Summer Manufacturing Camp program. From 2021 to 2025, SparkForce more than doubled the number of Summer Manufacturing Camps (see Figure 1 below).

**FIGURE 1: SPARKFORCE SUMMER MANUFACTURING CAMPS GROWTH (2021-2025)**



In order to meet the demand, SparkForce’s staff and board members have worked to raise funds to increase the programs’ reach. Along with increased demand comes the responsibility of ensuring the program is sustainable for years to come. One major way SparkForce is ensuring sustainability of the Summer Manufacturing Camp program is by cultivating long term partnerships with camp host sites. On average across the five-year period of this study, 67% of camp host sites are sites that have hosted camps previously (with a yearly range of 55%-79%). As the number of camps continue to grow, SparkForce has implemented systems and practices to ensure that not only is the program sustainable, but it also maintains quality. These practices include gathering programmatic data from camp hosts and camp participants as well as conducting strategic site visits to monitor progress, then using this data and feedback from camp hosts to refine the program’s implementation infrastructure and using data-based decision-making criteria when considering how, when, and where to expand the program.





## Impact Study Findings

### Findings Related to Short-Term Outcomes

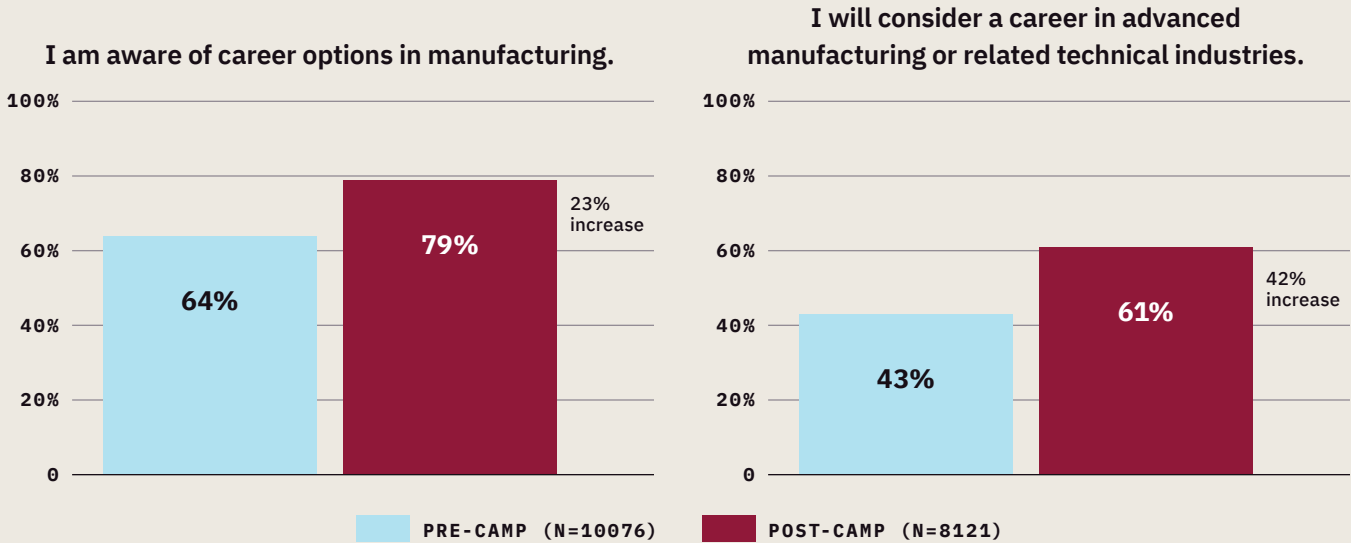
Camp participants were asked to complete a survey at the beginning and end of camp to capture changes in their awareness (e.g. of manufacturing career options), skill development (e.g. in designing and constructing a product using manufacturing software and equipment/tools), and perceptions about manufacturing (e.g. knowing what jobs are available in the community and that the jobs are high paying, in demand, provide a stable lifestyle, etc.). The response rate for camp participant post surveys averaged 60% with a range of 52-66% between the years 2021-2025. The response rates are considered excellent and well above the 30% threshold to be considered good. Therefore, the data should be deemed a representative sample of the overall number of camp participants for the time frame of this study.

Camp participant findings are organized by short term outcomes identified in the theory of change and show aggregate data over the past five years. Overall, the camp participant survey data shows SparkForce camps raise participants' awareness and interest in manufacturing careers and increase camp participants' knowledge and skill acquisition through project-based learning. As a comparison, aggregate findings from the previous impact study are included to show these trends in outcome achievement have held steady for over a decade despite a substantial increase in the number of camps and camp participants in the last five years.

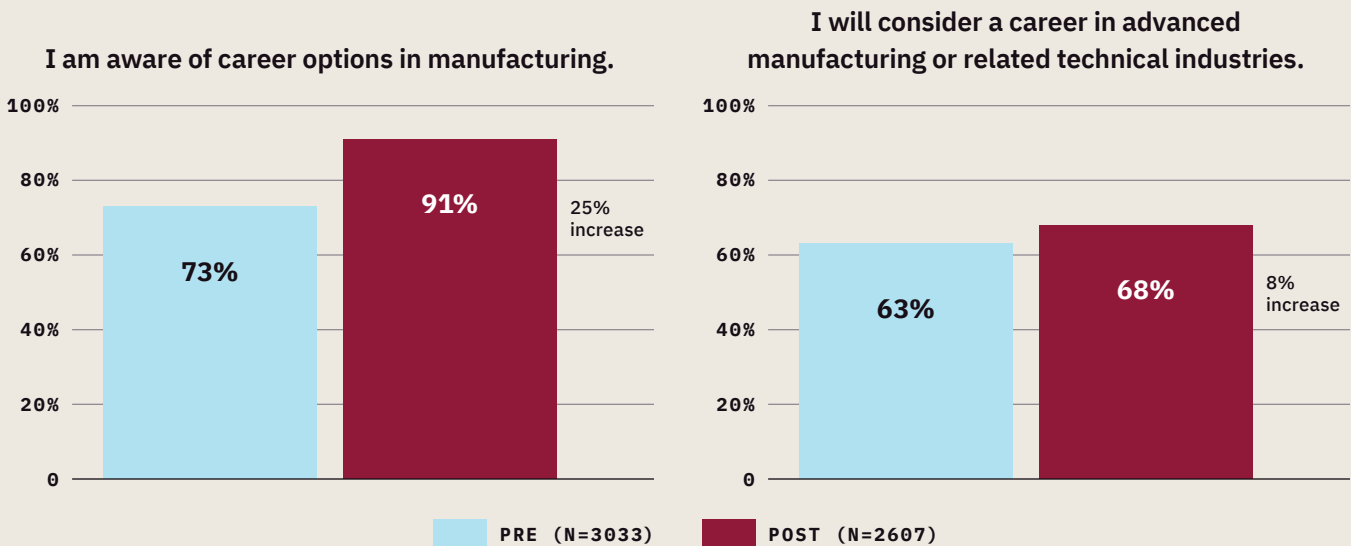
## Camp participants' awareness of and interest in careers in manufacturing

By the end of camp, camp participants reported they increased their awareness of manufacturing careers and a substantial number of participants shared that they were considering a career in advanced manufacturing as shown in **figure 3**. **Figure 4** comparison data from 2015-2020 show similar trends with a smaller increase in the number of camp participants who were considering a career in advanced manufacturing.

**FIGURE 3: CAMP PARTICIPANT PRE/POST SURVEY DATA – RAISE AWARENESS AND INTEREST IN MANUFACTURING CAREERS (2021-2025)**



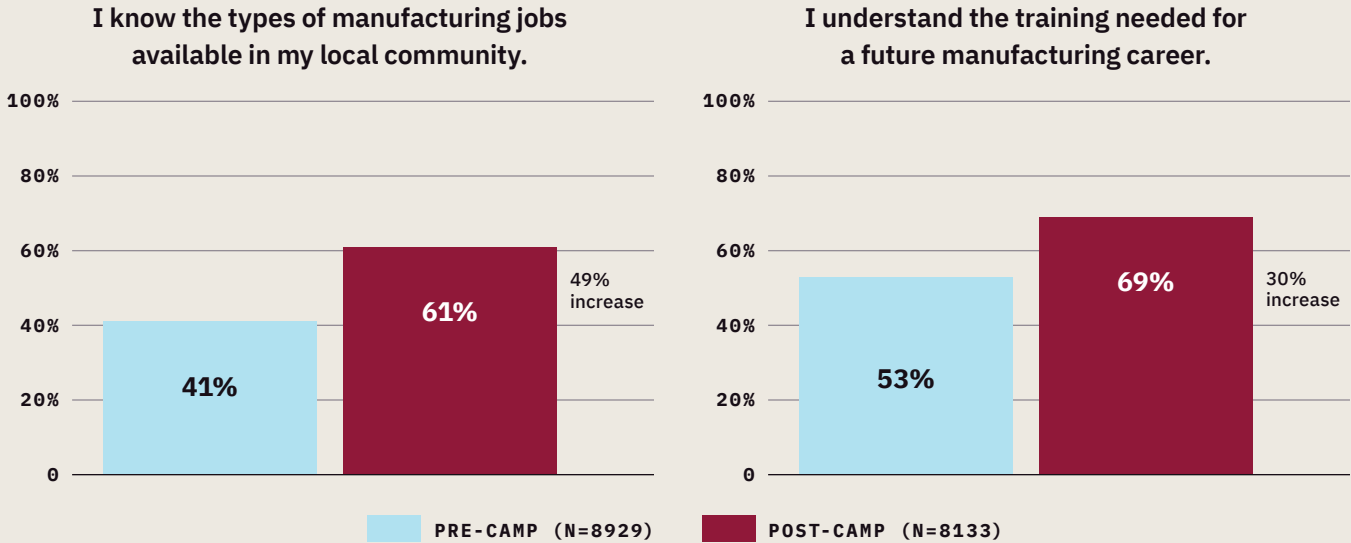
**FIGURE 4: CAMP PARTICIPANT PRE/POST SURVEY DATA – RAISE AWARENESS AND INTEREST IN MANUFACTURING CAREERS (2015-2020)**



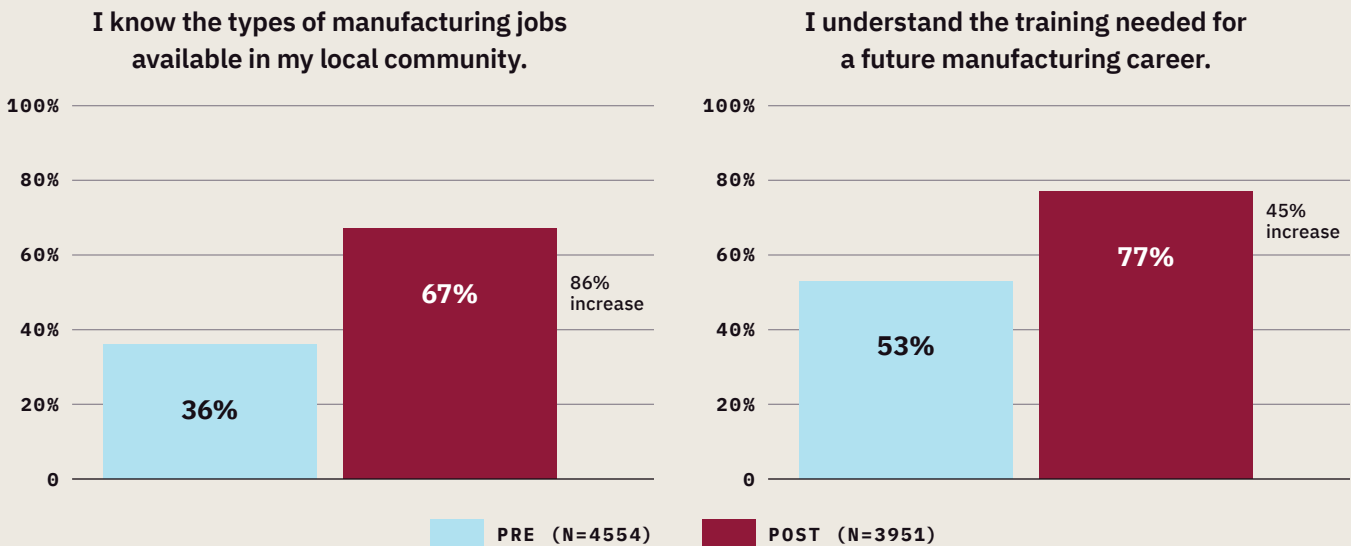
## Camp participants' awareness of local manufacturing jobs and the training needed

Camp participant survey data show that Summer Manufacturing Camps increased participants' awareness of the types of local manufacturing jobs in their communities and the training needed for a future manufacturing career. Trends in raising awareness of local jobs and the training needed remain steady when comparing the first and second impact study timeframes with a more substantial increase in awareness of local manufacturing jobs during the 2015-2020 timeframe (figure 6).

**FIGURE 5: CAMP PARTICIPANT PRE/POST SURVEY DATA – AWARENESS OF MANUFACTURING JOBS AND TRAINING NEEDED (2021-2025)**



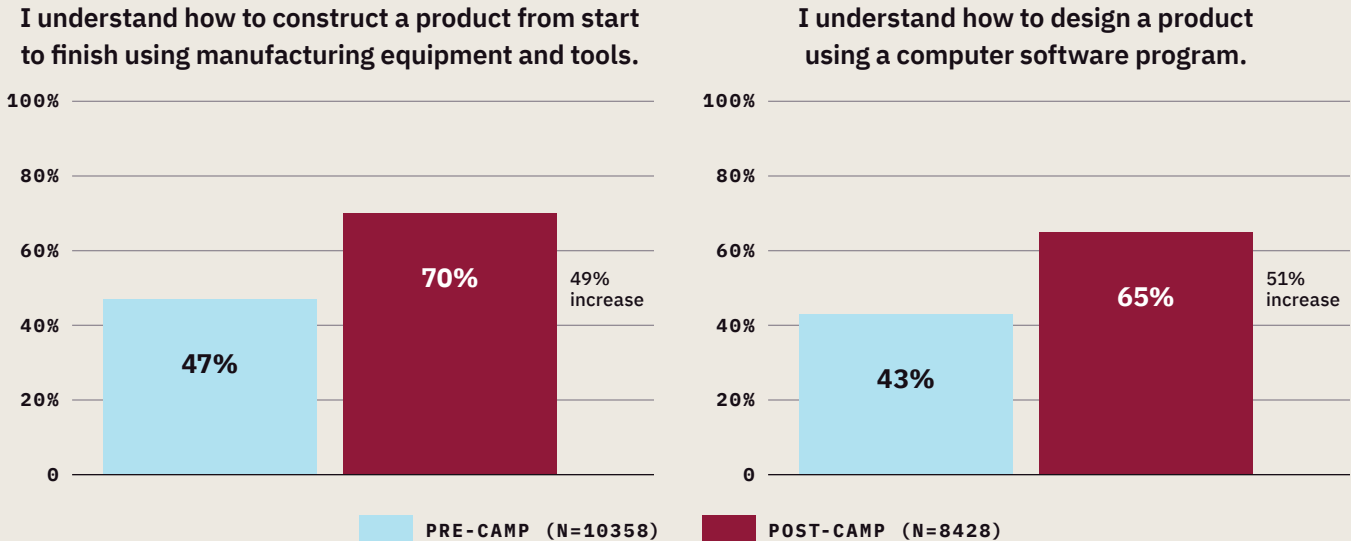
**FIGURE 6: CAMP PARTICIPANT PRE/POST SURVEY DATA – AWARENESS OF MANUFACTURING JOBS AND TRAINING NEEDED (2015-2020)**



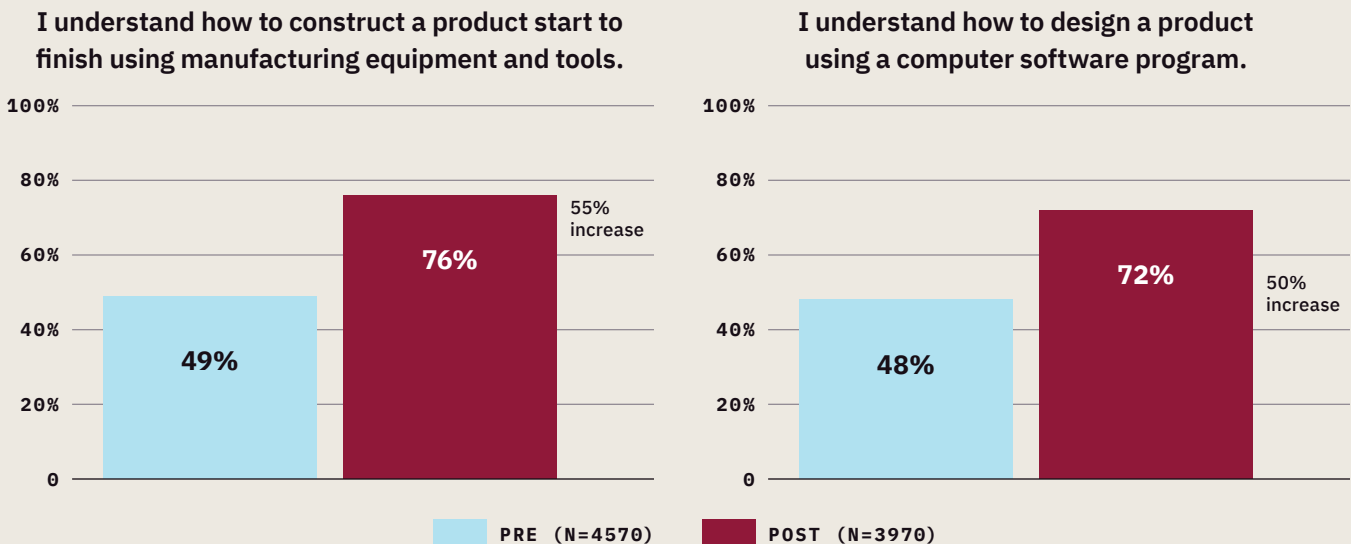
## Camp participants' skills acquisition

On the pre-camp and post-camp surveys, camp participants were asked to what extent they agree with the statements: "I understand how to construct a product start to finish using manufacturing equipment and tools" and "I understand how to design a product using computer software." When comparing pre/post survey data, camp participants report they increased their knowledge and skill acquisition substantially in designing and constructing a product. These trends held steady when comparing 2015-2020 (figure 8) and 2021-2025 (figure 7) data.

**FIGURE 7: CAMP PARTICIPANT PRE/POST SURVEY DATA – KNOWLEDGE AND SKILL ACQUISITION (2021-2025)**



**FIGURE 8: CAMP PARTICIPANT PRE/POST SURVEY DATA – KNOWLEDGE AND SKILL ACQUISITION (2015-2020)**



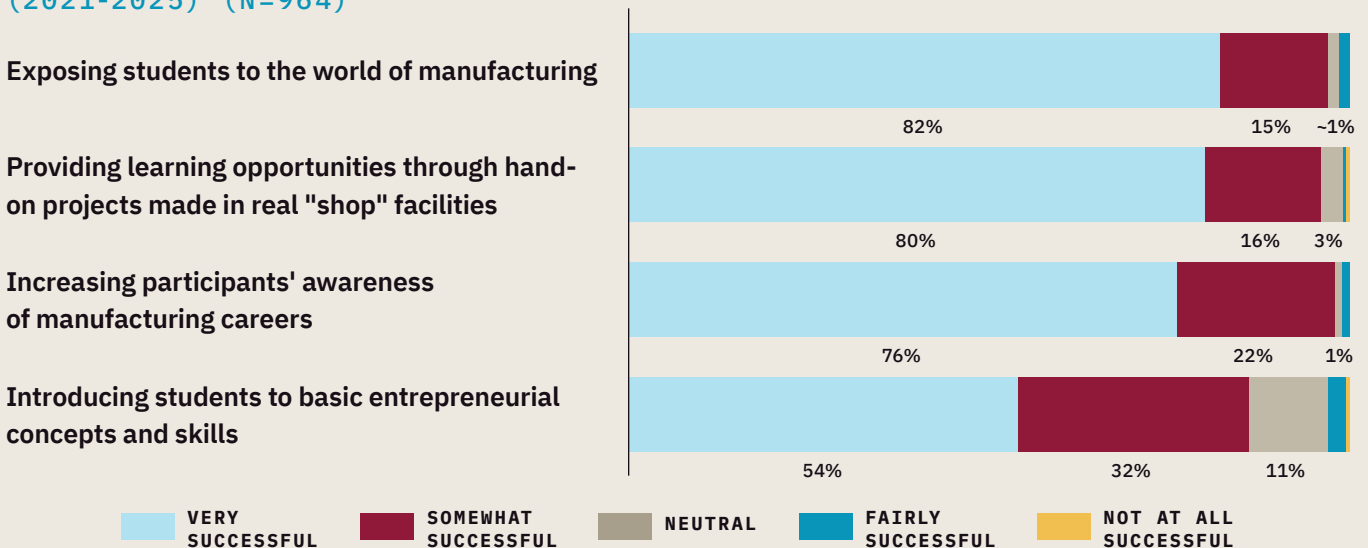
Camp participant survey data tells a consistent message: SparkForce Summer Manufacturing Camps raise participants' awareness of manufacturing career options and increase their skills in designing and constructing products through hands-on learning. This consistency in outcome achievement over the years can be attributed to reliable implementation of SparkForce camps by camp hosts.



### Camp hosts' success with implementing camp program objectives

While there is no formal fidelity measure to ensure all camps are implemented as intended and successfully deliver all camp program objectives, camp hosts were asked to self-rate the extent to which they were successful in fulfilling camp program objectives on their Final Evaluation Reports. Figure 9 represents aggregate camp host responses across a five-year period. Data shown in the graph below affirms camp participant results shown above. Almost all camp hosts (97%) reported that they were very (82%) or somewhat (15%) successful in exposing students to the world of manufacturing. Most camp hosts (96%) reported they provided project-based learning in real “shop” facilities and 98% reported they increased participants’ awareness of manufacturing careers. While the last statement, “introducing students to basic entrepreneurial concepts and skills” was the lowest rated (86%), an overwhelming majority of camp hosts reported they were successful in implementing it.

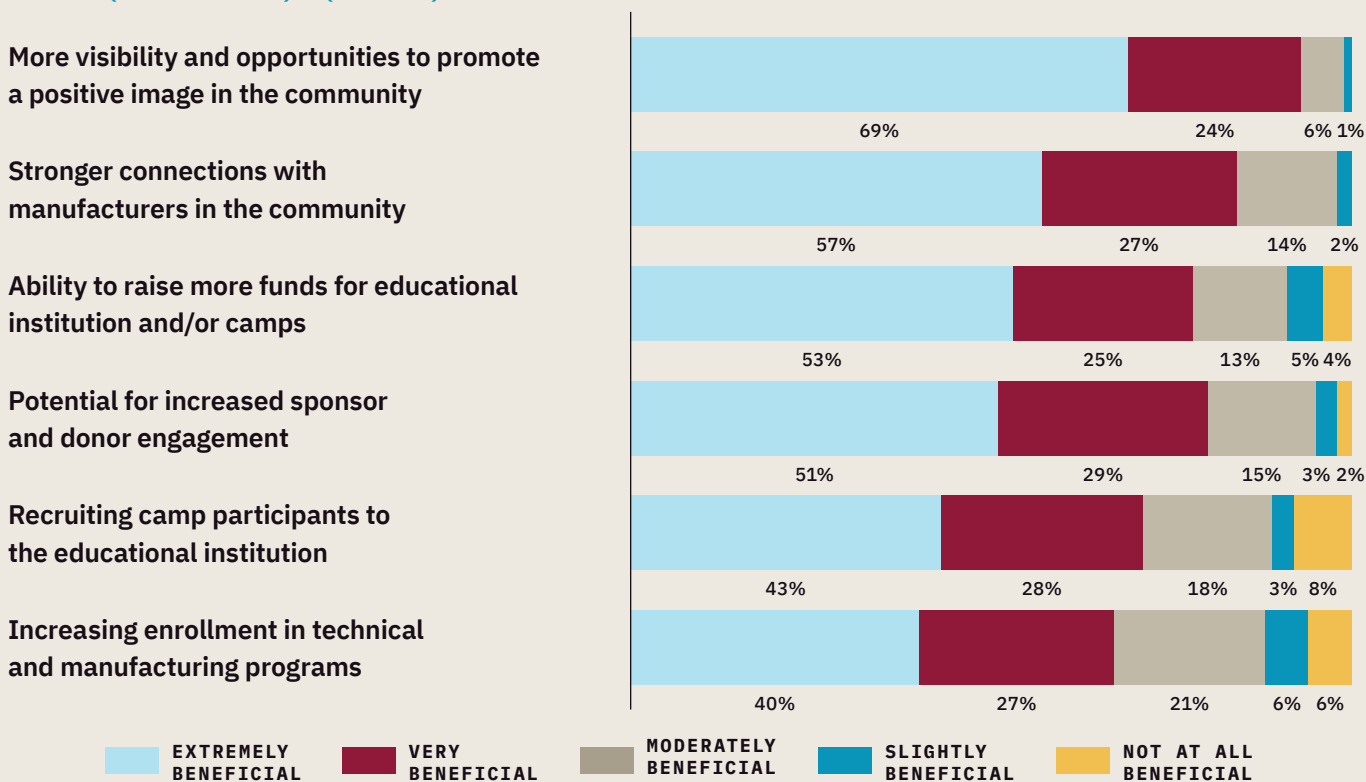
**FIGURE 9: CAMP HOST DATA – SUCCESS IMPLEMENTING CAMP PROGRAM OBJECTIVES (2021-2025) (N=964)**



## Benefits of hosting a manufacturing camp to camp hosts

Camp hosts were asked to rate statements on the extent to which aspects of hosting a camp were beneficial. Most statements were rated as extremely or very beneficial by camp hosts. Almost all camp hosts (93%) reported that hosting a Summer Manufacturing Camp was beneficial to their organization by promoting a positive image in the community. Aggregate data show 84% of camp hosts reported that they made new connections and strengthened relationships with local manufacturers due to hosting a camp. The lowest rated statement “increasing enrollment in technical and manufacturing programs” was rated as 67% extremely or very beneficial mostly because the target audience for these camps are middle school age youth who will not be ready to consider post-secondary education for a number of years.

**FIGURE 10: CAMP HOST DATA – BENEFITS OF HOSTING A SUMMER MANUFACTURING CAMP (2021-2025) (N=964)**



Additionally, camp hosts were asked several open-ended questions about what learnings from implementing the camp could have a positive impact on the local manufacturing industry and how hosting a camp has helped to build and/or strengthen partnerships with local manufacturers. Camp hosts provided rich descriptions of how they have applied what they learned from hosting a camp to have a positive impact on local industry. One theme that emerged from the final camp evaluations was that the camp host was more informed about the skills workers need for local manufacturing jobs and how educational institutions can partner with local manufacturers to ensure these skills are taught as illustrated in the quote below.



*I learned more about the type of values and soft skills [local manufacturers and] industries are looking for. This will help me as a professor better prepare my students – which will impact the community that [my educational institution] serves.*

— 2024 Summer Manufacturing Camp Instructor

Local manufacturers who participated in camps shared with camp hosts the positive impact the experience had on their workers and company. One such theme that emerged from camp host reports was that manufacturers understood the value in interacting with younger students by giving them the chance to see manufacturing work in real life as described in this quote.



*The manufacturing industry partners really enjoy working with the students. It is fun to see the pride they take in what they do especially when the participants are watching real work in action.*

**— 2025 Summer Manufacturing Camp Host**

Indeed, many local manufacturers who participated in SparkForce camps expressed an interest in creating a partnership with camp host sites. These partnerships manifested in manufacturers pledging to sponsor next year's camps and/or extending their partnership with the host institution to strengthen current certifications and degree programs by having industry experts assume advisory roles. The quotes below illustrate the varied ways camp hosts and local manufacturers strengthen their relationships, which in turn benefit the local manufacturing industry.



*As a result of this camp, one of our manufacturing partners has already committed a donation for Summer 2026. They recognize the value of investing in these students and view them as potential future employees.*

**— 2025 Summer Manufacturing Camp Host**



*Collaborating with local industry partners during the summer camps has allowed us to build relationships throughout the year. The industry partners attend campus events, serve as experts in our occupational development courses, and provide a positive voice about our camps and campus in the community, often recommending the camps to others at outside events.*

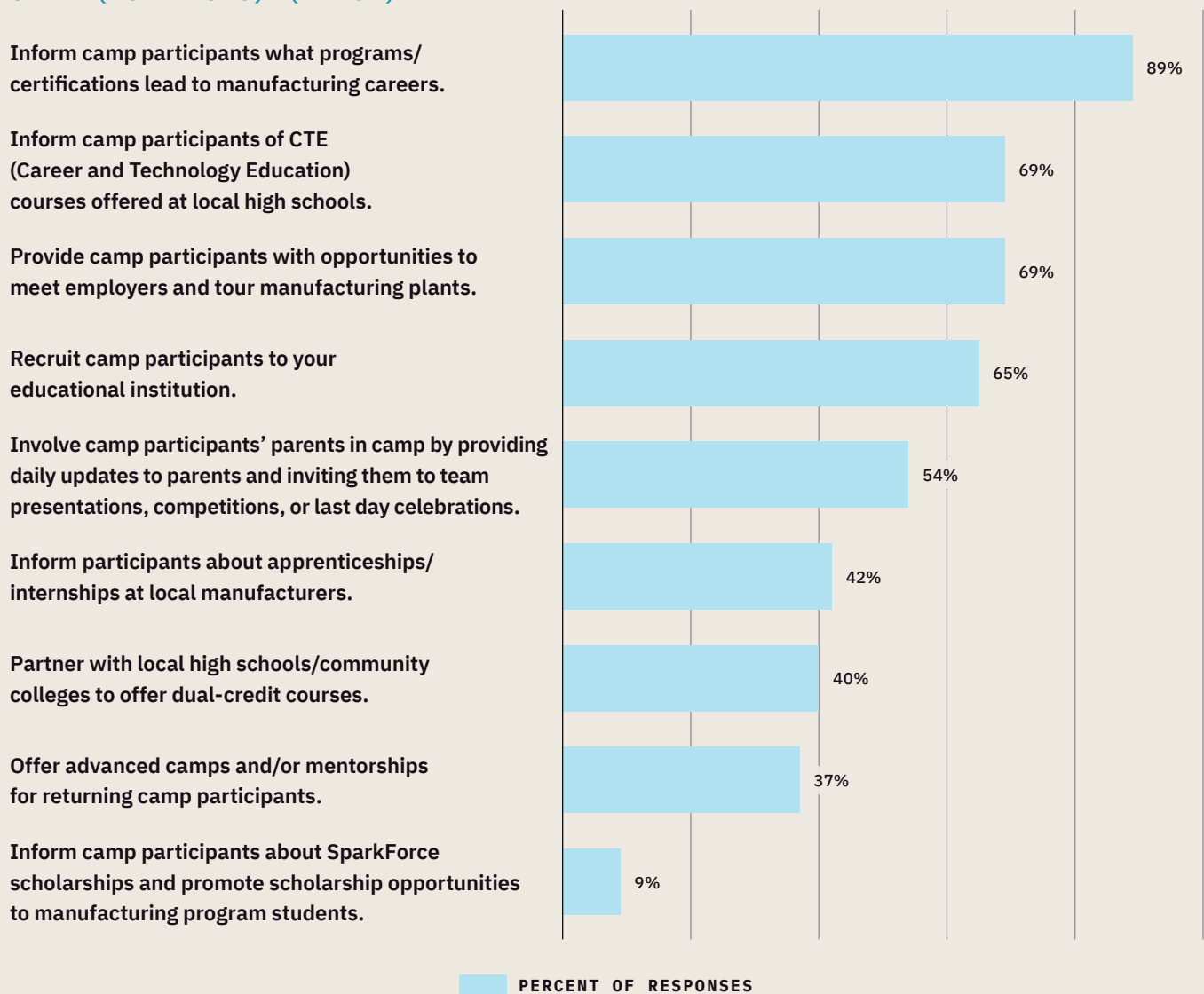
**— 2024 Summer Manufacturing Camp Host**



## Camp hosts' promotion of manufacturing careers

Camp hosts were asked to report on what ways they promoted manufacturing careers in their Summer Manufacturing Camps. The graph in figure 10 below shows that camp hosts use a variety of ways to promote manufacturing careers to camp participants. The top four responses show that camp hosts try to reinforce in camp participants that they can pursue their interest in one or more manufacturing career pathways by knowing about programs and certifications that lead to manufacturing careers (89%), taking CTE courses in middle and high school (69%), meeting local manufacturing employers (69%), and learning more about educational institutions that host SparkForce camps (65%).

**FIGURE 10: CAMP HOST DATA – BENEFITS OF HOSTING A SUMMER MANUFACTURING CAMP (2021-2025) (N=964)**



Through Summer Manufacturing Camps, camp hosts conveyed information to camp participants that is integral to career exploration in manufacturing careers. Having learned this information, camp participants were well equipped to make decisions on pursuing interests that they learned in camp if they chose to pursue them further. The next section covers how camp participants chose to pursue the interests they cultivated while at camp.

## Findings Related to Mid-term Outcomes

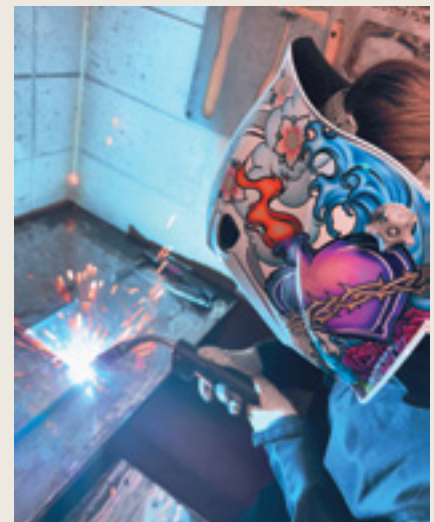
In the previous impact study from 2020, the evaluator and foundation staff developed several tools to gather mid-term outcomes. Unfortunately, these tools and methods for data collection were labor intensive for both staff and camp hosts alike. In addition, response rates were fairly low and were concentrated only on a small number of camps. Therefore, the mid-term outcome tools used previously were not used for this impact study. Instead, as noted in the “Limitations” section, it is stated that capturing mid-term outcomes is, in fact, a limitation in and of itself and recommendations for future research studies have been provided in the “Recommendations” section. While this study does not present quantitative evidence of mid-term outcomes, it does include an abundance of individual impact stories that speak to what camp participants do after attending a Summer Manufacturing Camp.

### Camp hosts' stories of individual impact

Camp hosts were asked to share at least one story of how the camp experience made a difference in an individual's life, and their responses were qualitatively analyzed and grouped into themes.

Responses that describe a general story of all students or a group of students were eliminated from the sample, as were duplicate responses that used the same individual story for multiple reports. In total, 583 responses were analyzed and grouped into themes.

There is clear evidence from camp hosts that mid-term outcomes were achieved in the last five years such as camp participants planning to take CTE courses, join school or community-based STEM clubs (e.g. robotics club), or pursue certifications or degrees in a manufacturing related field. The table on the following page shows themes gathered from camp hosts responses. Each theme includes a representative quote.



**TABLE 3: CAMP PARTICIPANT’S IMPACT STORY THEMES**

Theme	Quote
<p><b>Camp participant applied what they learned in camp to other experiences in their life</b></p>	<p>A camper took advantage of the welding camp this year to learn the skills he needed to know to complete the metal works project in 4-H and received a Blue Ribbon at the local fair for his project.</p>
<p><b>Camp participant plans to take courses or join a club after camp to further pursue their interest</b></p>	<p>A 7th grade student hasn't had much hands on experience in school. When we started the welding segment of our camp he expressed his interest in the subject. Once we let him loose in this booth - you could hear the excitement. "Oh my goodness, I can't believe it. I'm actually welding!" He is going to take CTE courses at his middle school this fall.</p>
<p><b>Camp participant chose to pursue a manufacturing higher education degree</b></p>	<p>I had a student that attended a summer camp a few years back. That student enrolled in my manufacturing program three consecutive years. That student received a full scholarship to a local community college and is now working.</p>
<p><b>Camp alumni return to help run camp</b></p>	<p>One student started as a middle school camper in our program two years ago and then returned again last summer as a volunteer helper. This year, she was old enough to apply for a paid position. She tested and made extensive revisions to 15 hands-on activity lessons for younger students, fixing many errors and making suggestions for improving component sourcing. She also learned to solder, and later in the summer taught this skill to several other students. She also taught several younger students to go through the complete process from coding to laser cutting their parts.</p>
<p><b>Parent praises camp for sparking an interest and built confidence in their child</b></p>	<p>A 14-year-old camper, who had never worked with robotics before and was unsure of what to expect. The parent had told us that her daughter mentioned being interested in technology but was intimidated. The parent was hoping this small (all female) environment would help her build the confidence she was seeking, especially with STEM topics and robotics.</p> <p>During one of the programming challenges, she took the lead in figuring out the coding steps and guiding her team through trial and error until they completed the task successfully. She said it was the first time she felt confident using real-world technology in a hands-on way.</p>

While tracking long-term outcomes remains a challenge due to the short-term nature of the camps and age of participants, qualitative stories collected from camp hosts provide compelling evidence that many youths continue their engagement with manufacturing through coursework, extracurriculars, and higher education. These narratives underscore the camp's potential to influence career trajectories well beyond the camp experience.

## Limitations

As was noted above and in the previous impact report, most limitations when evaluating SparkForce's Summer Manufacturing Camps are the barriers to tracking camp participant mid-term outcomes. Indeed, the design of the Summer Manufacturing Camp program model may contribute to limiting what mid-term outcomes can be tracked. Due to the one-to-two-week length of the camp program, the age of the campers (12-16), and the fact that many camp hosts have no long-term connection with camp participants, there are multiple barriers to tracking camp participants once they have completed a camp to when they might enter the workforce. SparkForce and the organizations that implement Summer Manufacturing Camps would all need to develop both infrastructure and formal systems to track individual camp participants after they leave camp if SparkForce wants to capture these mid-term outcomes in a systematic way.



# Recommendations

Recommendations presented here convey ways to further strengthen previously-developed systems and processes SparkForce has in place for program evaluation. It is suggested that SparkForce staff develop a one-to-three-year plan to make the recommendations below actionable.

## 1. Continue to embed program evaluation into SparkForce's organizational culture.

SparkForce has done a commendable job ensuring that program evaluation is rooted in daily operations of the organization. As SparkForce's programs continue to expand their reach, it will be important to ensure staff capacity to monitor data collection, analyze data, and translate findings into actionable objectives for program improvement. SparkForce should forecast program growth over the next five years and consider how program evaluation will need to grow with it. Additionally, SparkForce staff should consider ways to inform all staff on a regular basis about program evaluation and how it is used to drive program improvement.

## 2. Continue to explore ways to gather and analyze data on the manufacturers who engage with SparkForce Camps and their perceptions of the Camp program's impact on the industry.

Manufacturers remain key stakeholders in the Summer Manufacturing Camps program; however, SparkForce has found direct engagement with those acting as external sponsors of individual camps/camp host organizations to be difficult and labor intensive. SparkForce should continue to explore more efficient methods for contacting and surveying participating manufacturers. Strengthening this feedback loop will help SparkForce assess the role manufacturing partners have in successful camp outcomes and longer-term outcomes for the industry, as well as providing a better understanding of the outcomes manufacturers hope to see in the future by supporting the Summer Manufacturing Camps.



## 3. Consider ways to evaluate longer term impact of camps through research studies.

Longterm impact tracking proves to be a barrier for SparkForce. While it might not be feasible to develop a system for tracking longer-term camp participant outcomes, SparkForce should consider commissioning a longitudinal research project to follow camp participants or a research study of experienced camp hosts to assess the benefits of SparkForce camps on workforce development infrastructure in their respective communities.

# Conclusion

Over the past five years, SparkForce’s Summer Manufacturing Camps have continued to demonstrate meaningful and measurable impact in addressing the manufacturing industry’s skilled labor shortage by inspiring the next generation of workers. The program’s growth and sustainability, which is reflected in its expansion of camps, strong partnerships with camp host sites, and consistent outcomes across thousands of participants annually, affirm that SparkForce plays a fundamental role in manufacturing career exploration for middle school and high school students.

Findings from this study show that SparkForce camps consistently increase participants’ awareness of manufacturing careers, build hands-on technical and problem-solving skills, and improve their confidence in pursuing STEM coursework and CTE pathways. Camp hosts report substantial benefits including strengthened relationships with local manufacturers and increased visibility of their institutions within the community. Together, these outcomes demonstrate a proven, scalable model that connects education, industry and the community to foster workforce development in manufacturing.

As SparkForce moves forward, its continued commitment to embed program evaluation into organizational culture and to strengthen data-driven decision-making will be critical to sustaining program impact. By fostering partnerships between manufacturers and educational institutions, exploring long-term camp participant tracking, and continuing to elevate awareness of manufacturing’s diverse career pathways, SparkForce is well positioned to expand its influence and ensure that more young people are inspired and prepared to pursue careers in manufacturing.



# Contributors to this Report

## EVALUATION CONSULTANT

**Holly Lewandowski**, president of Evaluation for Change, Inc., has worked in program evaluation for over 25 years and founded her program evaluation and research consulting firm 17 years ago. Holly's program evaluation work has primarily centered on education spanning from early childhood to postsecondary with institutions such as Start Early, City Colleges of Chicago, Westat, Roosevelt University and University of Illinois at Chicago. In addition to conducting program evaluations and small research studies, she has provided capacity building on creating evaluation systems with nonprofits, foundations, and educational institutions such as the National Philanthropic Collaborative of Young Women's Initiatives, Polished Pebbles Girls Mentoring Program, Little Brothers – Friends of the Elderly, Chicago, and Candor Health Education. Additionally, she has held positions in evaluation and research at DePaul and Northwestern Universities. She earned her MA in Sociology at DePaul University and BA in Anthropology at Antioch College.

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