

# Minnesota State Advanced Manufacturing Center of Excellence: ATE Regional Center Evaluation

## *Summary of Progress for 2017-18*

The mission of the Minnesota State Advanced Manufacturing Center of Excellence: ATE Regional Center (known as “MSAMCOE” or “the Center”) is to increase the quantity, quality, and diversity of skilled and knowledgeable workers in the field of manufacturing. As a recipient of the National Science Foundation (NSF) 360 Manufacturing and Applied Engineering ATE Regional Center of Excellence award, the Center is required to report its progress throughout the four-year grant; therefore, the Center contracted with Wilder Research (Wilder) to conduct an evaluation that provides rigorous and unbiased information to multiple stakeholders. This summary highlights survey data collected during spring, summer, and fall of 2017; reporting from 2018 is forthcoming. This summary includes:

- **2017 summer camp surveys:** An important aspect of the Center’s mission is to expose students to science, technology, engineering, and math (STEM) and increase enthusiasm for manufacturing careers. To this end, the Center and its partners host a variety of youth outreach events that emphasize STEM and manufacturing fields. These events – which are generally referred to as “camps” – range from hands-on robotics camps to career exploration events. At the end of each camp, youth participants complete a satisfaction survey. This survey has remained fairly consistent since 2012, when the Center and Wilder Research developed the tool.
- **2017 Tour of Manufacturing surveys:** In fall 2017, the Center and its partners coordinated over 147 manufacturing businesses across Minnesota to provide tours of their facilities for students and educators, job seekers, other manufacturers, and the general public. The event, called the Dream It. Do It. Minnesota Statewide Tour of Manufacturing, took place throughout the month of October. Since the Tour began in 2011, the Center estimates that more than 60,000 people have participated, including nearly 20,000 people during the 2017 Tour alone. To help understand the implementation and impact of the tours, Wilder Research developed a paper survey that was administered to Tour participants, as well as a web-based survey for the manufacturing businesses that hosted the tours. Both youth and adult participants are invited to complete the survey; however, in 2017, the vast majority of respondents were youth (94%).

- **Data from Minnesota State’s Integrated Statewide Record System (ISRS):** Wilder staff obtain data from Minnesota State’s Integrated Statewide Record System (ISRS) to track the number of college graduates in manufacturing-related fields. This report includes preliminary data from the Center’s partner institutions. These data are currently undergoing validation; final numbers will be available in future reports.

## Promoting the manufacturing industry

One of the Center’s primary goals is to promote manufacturing careers across the state of Minnesota. In 2013, Wilder Research and the Center developed a series of perceptions questions to track attitudes of youth and adult participants in the Center’s activities. Results from the 2017-18 youth event and Tour of Manufacturing surveys show perceptions of manufacturing improved following each activity (Figure 1). It should be noted that the sample sizes and audiences for each of these surveys are different; therefore, the results should not be compared to each other.

### 1. Perceptions of manufacturing careers

How did you feel about manufacturing careers before the event/now?	Pre-event	Post-event	Change
<b>Summer camps 2017 (youth)</b>	<b>N=670</b>	<b>N=666</b>	
I thought/think they were/are good	28%	53%	+25%
I thought/think they were/are just OK	41%	30%	-11%
I didn’t/don’t think they were/are good	8%	3%	-5%
I didn’t/don’t think about them	13%	5%	-8%
<b>Tour of Manufacturing 2017 (youth and adults)</b>	<b>N=321</b>	<b>N=318</b>	
I thought/think they were/are good	28%	60%	+32%
I thought/think they were/are just OK	39%	25%	-14%
I didn’t/don’t think they were/are good	9%	6%	-3%
I didn’t/don’t think about them	16%	3%	-13%
I’m not sure	8%	6%	-2%

Event participants were asked to select words they felt best described manufacturing careers; the list included five positive and five negative adjectives. Figure 2 shows the three most frequently selected words for each survey. The top three words for the summer camp surveys were all positive, as were two of the top three for the Tour of Manufacturing. Tour participants most often selected “noisy,” which was probably due to their immediate experiences touring a manufacturing facility. “Creative” appeared in both lists.

## 2. Words that best describe manufacturing careers

Which of the following words best describe your thoughts about manufacturing careers?	N	%
<b>Summer camps 2017 (youth)</b>		
Fun*	455	68%
Creative*	426	64%
Exciting*	330	50%
<b>Tour of Manufacturing 2017 (youth and adults)</b>		
Noisy	171	54%
Creative*	170	53%
Advanced*	168	53%

Note. Asterisks denote positive words.

## Building youth interest in manufacturing

Improving awareness and interest in manufacturing careers is an important goal for the Center and its partners. Among manufacturers who completed the Tour of Manufacturing host survey, 85 percent said that building awareness of or interest in manufacturing as a career option was a “very valuable” component of the Tour. Nearly all manufacturers said that participating in the Tour was “very” or “somewhat” worthwhile (95%) and more than two-thirds (68%) said they would “certainly” participate again.

Post-event surveys show that awareness of manufacturing careers increased among respondents for both the Tour of Manufacturing and youth event surveys (Figure 3). Before the events, about one in five respondents (22%) reported the highest level of awareness of careers in manufacturing; after, more than one-third of youth summer camp participants (36%) and nearly half of Tour participants (47%) reported the highest level.

## 3. Awareness of manufacturing careers among youth

Think about before the event/now. How much were/are you aware of careers in manufacturing?	Pre-event	Post-event	Change
<b>Summer camps 2017 (youth)</b>			
	<b>N=684</b>	<b>N=671</b>	
A lot	22%	36%	+14%
Some	42%	41%	-1%
Very little	26%	15%	-11%
Not at all	11%	8%	-3%
<b>Tour of Manufacturing 2017 (youth and adults)</b>			
	<b>N=314</b>	<b>N=314</b>	
A lot	22%	47%	+25%
Some	46%	39%	-7%
Very little	24%	10%	-14%
Not at all	9%	5%	-4%

Interest in manufacturing careers also increased, but more modestly than perceptions of manufacturing. In both surveys, about 30 percent of participants reported “a lot” of interest in manufacturing careers after the event (Figure 4). The percentage of participants reporting “a lot” of interest increased by 9 and 15 percentage points for those who attended summer camps and the Tour of Manufacturing, respectively.

#### 4. Interest in manufacturing careers

Think about before the event/now. How much were/are you interested in manufacturing careers?	Pre-event	Post-event	Change
<b>Summer camps 2017 (youth)</b>	<b>N=684</b>	<b>N=667</b>	
A lot	19%	28%	+9%
Some	35%	41%	+6%
Very little	28%	18%	-10%
Not at all	18%	12%	-6%
<b>Tour of Manufacturing 2017 (youth and adults)</b>			
A lot	14%	29%	+15%
Some	42%	44%	+2%
Very little	31%	18%	-13%
Not at all	14%	9%	-5%

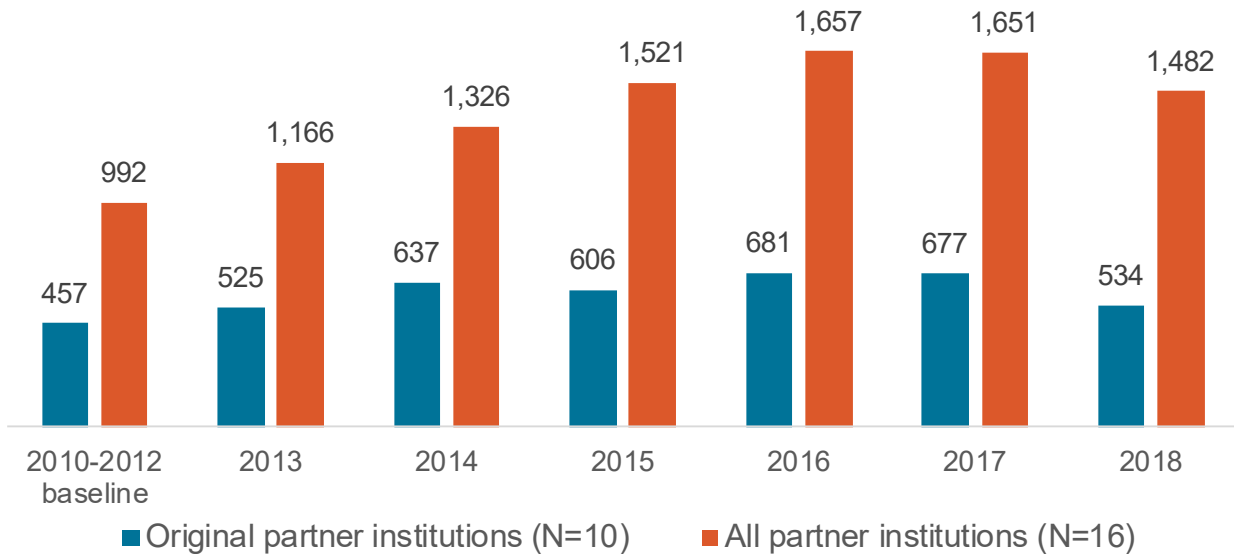
## Increase the number of graduates

Increasing the quantity of graduates in manufacturing-related programs (i.e., programs in engineering, precision production, etc.) is a primary goal of the Center. It is also a lagging indicator of success, because it can take years to recruit and move students through programs. Figure 5 shows the number of annual graduates in Center-affiliated programs for two groups of the Center’s partners: its ten original partner institutions – which began working with the Center in 2011 – and its full group of sixteen partner institutions, which include both original and more recent partners. The number of graduates from each year can be compared to the 2010-12 baseline, which averages the number of graduates from 2010, 2011, and 2012 to show how the Center’s work may have impacted the number of graduates.

Since the 2010-12 baseline, the number of graduates in Center-affiliated programs has increased substantially, with much of the growth driven by new partners. During academic year 2018, 534 students graduated from an affiliated program at one of the Center’s original ten partner institutions, and 1482 students graduated from one of the Center’s sixteen partners. The greatest increase over baseline occurred during 2016, wherein the original partners experienced a 49 percent increase in graduates relative to baseline, and all partners experienced a 67 percent increase relative to baseline. After

peaking in 2016, the number of graduates in 2017 and 2018 declined somewhat, perhaps due to the strong economy. However, the number of graduates in 2018 still represents an increase compared to the 2010-12 baseline, of 17 percent and 49 percent for original partners and all partners, respectively.

## 5. Center-affiliated program graduates by year



Note. The list of Center-affiliated programs was updated this year to better reflect the targeted programs. Graduates who received multiple awards (e.g., a diploma and an associate degree) in the same year are counted multiple times. These data are undergoing validation and should be considered preliminary.

## Summary and issues to consider

Based on the data available, the Center is meeting its goals of promoting manufacturing, particularly building youth interest around manufacturing. Below are several key successes and recommendations:

- **Summer camps and the Tour of Manufacturing improve participants’ perceptions of manufacturing.** Tour of Manufacturing and summer camp participants report more positive attitudes toward manufacturing following the event. In general, participants more often associate manufacturing careers with positive words, such as creative and fun.
- **The number of graduates in Center-affiliated higher education programs has increased since 2010-12.** During 2018, 1482 students earned a degree in an affiliated program from one of the Center’s sixteen partner institutions, including 534 who graduated from one of 360’s ten original partners. These numbers represent a 49 percent and 17 percent increase in the number of graduates, respectively, compared to the 2010-12 baseline.

- **Businesses participating in the Tour of Manufacturing value outreach.** Among businesses who participated in the Tour of Manufacturing host survey, 85 percent said that building awareness of or interest in manufacturing as a career option was “very valuable” for their business. The Center’s support of the Tour helps manufacturers achieve this end.

**Increasing youth interest in manufacturing careers remains an opportunity.** Since this series of survey questions was first introduced in 2012, youth interest in manufacturing has experienced more moderate improvements than other measures. To support development in this area, the Center’s outreach activities could expand their emphasis on manufacturing careers.

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451 Lexington Parkway North  
Saint Paul, Minnesota 55104  
651-280-2700  
[www.wilderresearch.org](http://www.wilderresearch.org)

### **For more information**

For more information about this report, contact Sarah Gehrig at Wilder Research, 651-280-2718.

Authors: Sarah Gehrig

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