**TRANSFORMING EDUCATION FOR ADVANCED MANUFACTURING SOUTH DAKOTA (TEAM SD)**

# Lake Area Technical Institute
**Trade Adjustment Assistance Community College and Career Training Grant**
**Third Party Evaluation Interim Report**
**Reporting Period:  October 1, 2014 – September 30, 2016**

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# Table of Contents

## Executive Summary

**TAACCCT Program/Intervention Description and Activities**

- Lake Area Technical Institute (LATI), located in Watertown, SD, was awarded a four-year federal TAACCCT grant in October of 2014 to address the growing workforce need in South Dakota's advanced manufacturing industry.
- LATI's efforts involved five existing programs of study: Electronics/Robotics (AAS); Energy Operations/Technology (AAS), High Performance Engine Machining (AAS); Precision Machining (AAS); and Welding Technology (Diploma/AAS).
- Transforming Education for Advanced Manufacturing in South Dakota (TEAM SD) focuses on four components: pipeline development and expansion; curriculum enhancement and expansion; an accelerated education model; and improved employer relationships and industry engagement.

**Evaluation Design**

- The goal of the evaluation of the TEAM SD program is to provide program leaders, partners, and funders with data-based observations for informing the implementation process and for making judgments about program effectiveness.
- A logic model was created with program leaders and describes how the project intervention strategies address the growing need for highly-skilled positions in the advanced manufacturing industry.
- Four evaluation questions used to focus the implementation analysis were required in the TAACCCT Round 4 Solicitation of Grant Application (SGA). Four additional questions were included in the evaluation design used to focus the outcome and impact analysis. Two summative evaluation questions were identified to address program success.
- The interim report focuses on baseline data due to the late start of the evaluation process.

**Implementation Findings**

- TEAM SD is leveraging learnings and work from previous rounds of TAACCCT. Some of TEAM SD staff positions are expansions of positions created in previous rounds of TAACCCT. Leadership conversations initiated during previous TAACCCT rounds have led to policy development and improved student services.
- An instructional designer and a technology integrationist were hired to assist instructors in designing and incorporating innovative and effective instruction.
- Nine activities are being implemented to accomplish the grant wok. All activities have either been completed or are in progress.

**Participant Impacts and Outcomes**

- All outcome measures are right on target or exceeded the year two target with the exception of outcome measures nine. This measure focuses on the number of participants employed at enrollment who receive a wage increase post-enrollment.

**Conclusion**

- TEAM SD has exceeded the two-year target number to increase the number of individuals earning advanced manufacturing credentials including degrees, diplomas, and other certifications.
- TEAM SD is implementing industry-standard equipment and technology in each of the identified advance manufacturing programs of study. A "Grow Your Own" model is being piloted in one business site and options are being explored to replicate this model in other area businesses.
- TEAM SD annually updates and publishes the Employment Results Scorecard on the South Dakota Department of Education website. The Third Party Evaluation Interim Report will be completed and submitted on time.

# Introduction

"In 2009, the American Recovery and Reinvestment Act amended the Trade Act of 1974 to authorize the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program.  On March 30, 2010, President Barack Obama signed the Health Care and Education Reconciliation Act, which included $2 billion over four years to fund the TAACCCT program.

TAACCCT provides community colleges and other eligible institutions of higher education with funds to expand and improve their ability to deliver education and career training programs that can be completed in two years or less, are suited for workers who are eligible for training under the TAA for Workers program, and prepare program participants for employment in high-wage, high-skill occupations." (https://www.doleta.gov/taaccct/)

The overarching goals of the program are to:

1. increase attainment of degrees, certifications, certificates, diplomas, and other industry-recognized credentials that match the skills needed by employers to better prepare workers eligible for training under the Trade Adjustment Assistance (TAA) for Workers Program of chapter 2 of title II of the Trade Act of 1974, and other adults for high-wage, high-skill employment or re-employment in growth industry sectors;
2. introduce or replicate innovative and effective methods for designing and delivering instruction that address specific industry needs and lead to improved learning, completion, and other outcomes for TAA-eligible workers and other adults; and
3. demonstrate improved employment outcomes.

## Context

Lake Area Technical Institute (LATI) is a nationally ranked two-year technical college located in the rural agricultural area of Watertown, SD.  The primary service area is 18,000 square miles which includes northeast South Dakota, western Minnesota, and southeastern North Dakota and encompasses three major South Dakota cities: Aberdeen, Brookings, and Watertown.

## Statement of Need

Transforming Education for Advanced Manufacturing in South Dakota (TEAM SD) targets advanced manufacturing for the following reasons:

- Manufacturing is the second leading Gross Domestic Product for South Dakota at 9.1%
- The predicted workforce growth for manufacturing from 2012-2020 is 17.0%
- The 2011 Skills Gaps Report indicates that 83% of responding companies report a moderate to serious shortage of available, qualified workers and 69% of companies expect this shortage to worsen over the next three to five years.

(South Dakota State Workforce Strategic Plan, SD State Integrated Workforce Plan Workforce Investment Act Title I Wagner-Peyser Act, updated November 2012, and Fastest Growing Industries 2010-2020, SD DLR, June 2012)

Additionally, the Governor's Office of Economic Development (GOED), which works with local community economic development corporations to expand job opportunities for all South Dakotans, identified advanced manufacturing as one of their focuses for business recruitment and growth efforts.

In response to South Dakota's lack of qualified applicants to fill workforce needs, Governor Dennis Daugaard launched South Dakota Workforce Initiatives (SDWINS). During the spring of 2014, Governor Daugaard and the Workforce Cabinet hosted six regional Workforce Summits to discuss challenges and solutions across the business, education, community, and government sectors. During the regional summits, advanced manufacturing was identified as a targeted industry for workforce development.

In an attempt to address the gap in qualified workers in South Dakota, two scholarship programs provide students opportunities to train for high-wage, high-skill employment or re-employment at little to no cost to the student. In the fall of 2012, the South Dakota Critical Workforce Career Scholarship provided one-time money for 31 students enrolled in Precision Machining, Robotics, Electronics and Welding programs at LATI. In the fall of 2014, that scholarship program was reinstated by the governor.

In 2016, the Build Dakota Scholarship was initiated with 300 projected "full-ride" scholarships awarded annually (for the first five years) to students entering high-need workforce programs at South Dakota technical institutes. All students seeking an advanced manufacturing degree targeted by the TEAM SD program are eligible. Recipients commit to working in South Dakota, in their field of study, for three years following graduation.

## TAACCCT Program/Intervention Description and Activities

**TEAM SD Project Summary**

The TEAM SD project is a four-year grant funded from the U. S. Department of Labor, Employment and Training Administrations' (USDoLETA) Trade Adjustment Assistance Community College and Career Training Grants program (TAACCCT). The funding period began October, 2014 and extends through September, 2018. During the funding period, TEAM SD will develop and deliver a comprehensive career pathways and training program to address the growing workforce need in South Dakota's advanced manufacturing industry. TEAM SD focuses on four components:

1. pipeline development and expansion;
2. curriculum enhancement and expansion with advanced technology-enabled learning;
3. an accelerated education model; and,
4. improved employer relationships and industry engagement.

**TEAM SD Goals**

The goals of the TEAM SD project align to the National TAACCCT goals:

1. Increase attainment of degrees, certifications, diplomas, and other recognized credentials;
2. Introduce or replicate innovative and effective methods for designing and delivering instruction; and
3. Demonstrate improved employment outcomes.

**Grant Governance**

**Administrative Structure:**

The TEAM SD project implementation is under the supervision of LATI Vice President, Diane Stiles.  The Grant Manager, Terri Cordrey; Dean of Academics, Kim Bellum; and Director of Student Services, LuAnn Strait, share the responsibility for overseeing grant staff.  Grant decisions are made by a leadership team comprised of the LATI President, Michael Cartney, LATI Vice-President, Diane Stiles, and Grant Manager, Terri Cordrey.

**TEAM SD Intervention Strategies and Activities**

TEAM SD proposes to increase the attainment of degrees, certifications, diplomas, and other recognized credentials for students pursuing jobs in advanced manufacturing industries by creating and implementing a marketing plan that improves the image and interest in advanced manufacturing careers and education, increasing support for students during their educational journey, and providing innovative options for obtaining the required education and skills.

In order to accomplish the second goal, introduce or replicate innovative and effective methods of designing and delivering instruction, the TEAM SD program will create a competency-based education model that includes performance-based assessments and internship opportunities.  The current curriculum will be reviewed and advanced technology applications will be incorporated to support learners in developing new skills and allow them to complete learning outside the traditional classroom setting.

Improving participant employment outcomes will be accomplished by focusing efforts on retention services, career counseling, and extended support to students past graduation.

Additionally, previous TAACCCT grants have "leveraged strong partnerships between community colleges, the workforce system, employers and industry groups to transform the way courses are designed and delivered through accelerated learning strategies; redesigned curricula; distance learning; work-based training, and innovative uses of technology to enhance learning activities." (LATI Grant Application) TEAM SD continues to promote these strategies and to strengthen employer engagement throughout the grant process.  TEAM SD grantees will design programs that are responsive to the workforce needs of multiple employers within an industry sector by working closely with regional and national employers and industry groups.  These employer and industry partners will help identify and map necessary skills and

competences, as well as assist in designing curricula, programs, assessments or credentials that will help quickly connect ready-to-work Americans with ready-to-be-filled jobs.

## TEAM SD Programs

In response to the need for skilled workers in advanced manufacturing fields in South Dakota, TEAM SD leadership is focusing the work on the following five programs of study.

**Table 1: TEAM SD Program Delivery Methods**

| Program | Description |
|---|---|
| Electronics/Robotics | Electronic systems now form the powerful "central nervous system" of manufacturing and business technologies. There is a demand for robotic technicians in the high tech world of manufacturing as countless industries adopt the use of cutting-edge automated systems to improve safety and efficiency. Crucial areas include computer systems, automated manufacturing systems, medical machines, digital signs and displays etc.  This traditional and/or hybrid, 18 month program produces skilled technicians to design, manufacture, and support this technology.  (AAS) |
| Energy Operations/Technology | This traditional, 20 month program prepares students for a career in the operations of a power (coal, hydro, wind, nuclear, etc.) or process (ethanol, oil, bio-diesel, etc.) plant as well as technicians who have the skill and experience to maintain and repair production equipment.  (AAS) |
| High Performance Engine Machining | This traditional, 18 month program provides students with technical knowledge and hands-on skill necessary for a qualified high performance engine machinist in the automotive, diesel, and precision machining industries. (AAS) |
| Precision Machining | This traditional and/or hybrid, 18 month program prepares students in the working properties of metals using manual and cutting-edge computer-controlled methods to make precision-machined products. (AAS) |
| Welding | Students enrolled in welding technology may choose to receive a welding diploma in nine months or continue in the program to earn an Associate of Applied Science degree in 18 months.  The program features hands-on, interactive training in brazing, arc welding, heliarc welding, metal inert gas welding and oxyacertylene welding. (Diploma/AAS) |

## TEAM SD Population Served

A grant participant is defined as an individual who:
1) meets the criteria used to identify participants as definded in the Statement of Work; and
2) enrolls in a grant-funded program or course and attends the program or course more than once.

**Targeted Population**
1) Workers who have lost their jobs or are threatened with job loss as a result of foreign trade (TAA eligible recipients)
2) Veterans
3) Dislocated and incumbent workers

**Verterans Priority**
- The Jobs for Veterans Act requires priority of service to veterans and spouses of certain veterans for the receipt of employment, training, and placement services in any job training program directly funded, in whole or in part, by DOL.
- A veteran or eligible spouse will be given priority of service and admitted to the training program once it is dtermined that the veteran or eligible spouse meets the program's eligibility requirements.

## TEAM SD Participant Selection

**Grant Participant Selection Strategy**

I.  Grant participants will be selected based on the following criteria:
   A. Enrolled in one of the grant funded programs of study
   B. First or second year student
   C. Number of students to be selected for each program
      a. Electronics/Robotics – 70 students
      b. Energy/Plant Operations – 15 students
      c. High Performance Engine Machining – 71 students
      d. Precision Machining – 99 students
      e. Welding – 155 students

All students in the advanced manufacturing courses selected to be included in TEAM SD are considered grant participants. Two tests are used as indicators of success prior to students being admitted to programs at LATI: the ACT, a national college admissions examination that consists of subject area tests in English, Mathematics, Reading, and Science and COMPASS which tests student knowledge in math, reading, and writing.

Additionally, LATI uses the National Career Readiness Certificate (NCRC) to guage student success through a pre- and post-assessment process once students are admitted to a program of study. The NCRC is "an industry-recognized, portable, evidence-based credential that certifies essential skills necessary for workplace success." Students may achieve one of four levels: No certification, bronze, silver, or gold. Students scoring a bronze or no certification, are asked to take the post-test to try and improve their score. Utilizing this test improves career outcomes for students and employers.

## Evaluation Design

### Evaluation Purpose and Process

The goal of the evaluation of the TEAM SD program is to provide program leaders, partners, and funders with data-based observations for informing the implementation process and for making judgments about program effectiveness. The evaluation design reflects a formative assessment of the implementation of specific interventions and a summative assessment of the program's outcome measures.

### Design

The implementation design encompasses collecting relevant data from three primary sources: 1) program leaders and partners, 2) program participants, and 3) program deliverables and other documents. Confirmation of the implementation of each of the interventions associated with the three program goals are based on examination of program documentation and deliverables. Patterns and themes are derived from interview and survey data to identify strengths, weaknesses, and overall fidelity to the program model. Quarterly meetings with TAA staff provide data-based observations for the consideration of program leaders as they make decisions about the continuous improvement of the program.

### Data Strategies

Data to address the research questions is collected through online surveys, onsite interviews, and focus groups with program leaders, partners, instructors, and students. Rubrics are constructed and utilized to examine program deliverables and documentation. Coding and categorization techniques are used to uncover salient themes in the data.

### Evaluation Limitations

A delayed start to the evaluation activities provides a challenge to the evaluation. The TEAM SD program began in October, 2014, and evaluation activities were not approved for implementation until December, 2015. Baseline information and data collected during January – March of 2016 asked interviewees to recall their perceptions of the program's beginning phase in the fall of 2014. Another limitation is the sixth month processing time with the collection of wage data from the South Dakota Department of Labor and Regulation.

### Theory of Change

The TEAM SD program's theory of change includes an emphasis on re-imaging advanced manufacturing occupations through marketing efforts in order to increase enrollment in advanced manufacturing programs. Through technology-enabled and competency-based learning, technical assistance from business and industry, and proven student support systems, non-traditional students will complete advanced manufacturing programs and secure improved employment status in a more expedient and streamlined manner. By "upskilling" workers proficiency with the latest industrial equipment and technology, graduates will help South Dakota increase and strengthen its highly-skilled workforce.

The logic model for the TEAM SD program displayed below addresses the growing need for highly-skilled positions in the advanced manufacturing industry.

**Table 2: Logic Model**

| Inputs | Activities | Outputs | Short Term Outcomes | Intermediate Outcomes | Long Term Outcomes |
|---|---|---|---|---|---|
| LATI advanced manufacturing programs and advisory councils, regional manufacturers, TAACCCT Round 4 funds, industry-grade technologies and equipment. | Advanced manufacturing marketing campaign, additional marketing assistant, career pathways coordinator, and continuous improvement coordinator positions, expansion of virtualization and simulation components of AM courses, expanded use of Student Success Toolkit and TED (Technical Education at a Distance Model), improved technology infrastructure at LATI, publication of Employment Results Scorecard, Third Party Evaluation. | Marketing Campaign Package, Grow Your Own Business Model, Career Pathways Model, Continuous Improvement Publication, course design and materials, Student Success Toolkit and TED Model, IT servers and storage, Employment Results Scorecard, Third Party Evaluation Reports. | Increased enrollment in AM programs, innovative designs for delivering AM programs, increased institutional capacity at LATI. | Increased numbers of degrees, certificates, diplomas, and other credentials recognized by the AM industry.<br><br>Documented and reliable models of hybrid delivery of AM programs. | Increased numbers of employees working in AM industry with increased wages over previous employment. |

**Evaluation Questions**

The following four evaluation research questions required in the SGA represent the core of the implementation analysis for the TEAM SD program.

**Table 3:  SGA Required Evaluation Questions**

| Evaluation Question | Indicator or Performance Measure | Methods | Data Sources | Frequency |
|---|---|---|---|---|
| How was the particular curriculum for the advanced manufacturing programs selected, used, and/or created? | Goal 2:  Introduce or replicate innovative and effective methods for designing and delivering instruction. | Interviews Surveys Document Review | Site Visits Surveys Course Materials Project Documents | Spring 2016 Spring 2017 |
| How were programs and program designs improved or expanded using grant funds?  What was the program administrative structure?  What support services and other services were offered? | Goal 2:  Introduce or replicate innovative and effective methods for designing and delivering instruction. | Interviews Surveys Document Review | Site Visits Surveys Course Materials Project Documents Deliverables | Spring 2016 Winter 2016 Spring 2017 |
| Was an in-depth assessment of participants' abilities, skills, and interests conducted to select participants into the grant program?  What assessments tools and processes were used? Who conducted the assessment?  How were the assessment results used?  Were assessment results useful in determining the appropriate program and course sequence for participation?  Was career guidance provided, and if so, through what methods? | Goal 1:  Increase attainment of degrees, certifications, certificates, diplomas, and other industry-recognized credentials. | Interviews Document Review | Site Visits Project Documents | Spring 2016 Winter 2016 Spring 2017 |
| What contributions did each of the partners (employers, workforce system, other training providers and educators, philanthropic organizations, and others as applicable) make in terms of: 1) program design, 2) curriculum development, 3) recruitment, 4) training, 5) placement, 6) program management, 7) leveraging of resources, and 8) commitment to program sustainability? | Goal 1:  Increase attainment of degrees, certifications, certificates, diplomas, and other industry-recognized credentials; Goal 2:  Introduce or replicate innovative and effective methods for designing and delivering instruction; Goal 3: Demonstrate improved employer outcomes. | Interviews Surveys Document Review Deliverable Review | Site Visits Surveys Project Documents Deliverables | Spring 2016 Spring 2017 |

| What factors contributed to partners' involvement or lack of involvement in the program?  Which contributions from partners were most critical to the success of the grant program?  Which contributions from partners had less of an impact? | | | | |
|---|---|---|---|---|

In addition to the implementation research questions, the evaluation will also address the following outcomes/impact analysis research questions:

**Table 4:  Implementation Research Questions**

| Evaluation Question | Indicator or Performance Measure | Method | Data Source | Frequency |
|---|---|---|---|---|
| To what extent did each outcome measure reach its targeted goal? | Goal 1:  Increase attainment of degrees, certifications, diplomas, and other recognized credentials; Goal 2:  Introduce or replicate innovative and effective methods for designing and delivering instruction; Goal 3: Demonstrate improved employer outcomes. | Descriptive Statistics Student Questionnaire | Student records Institution records DLR records | Spring 2016 Spring 2017 Fall 2018 |
| How did the aggregate performance of the grant participants compare to previous advance manufacturing students in terms of enrollment, program completion, and time-to-completion? | Goal 1:  Increase attainment of degrees, certifications, diplomas, and other recognized credentials. | Descriptive Statistics | Student records Institution records | Spring 2016 Spring 2017 Fall 2018 |
| Which of the outcome measures displayed the most growth over the duration of the grant period?  Which displayed the least growth? | Goal 1:  Increase attainment of degrees, certifications, diplomas, and other recognized credentials. | Descriptive Statistics | Student records Institutional records DLR records | Spring 2016 Spring 2017 Fall 2018 |

Two additional implementation research questions were included in the evaluation design. (These are summative in nature and will be evaluated in the final evaluation report.)

**Table 5: Additional Implementation Research Questions**

| Evaluation Question | Indicator or Performance Measure | Method | Data Source | Frequency |
|---|---|---|---|---|
| To what extent did each of the program's interventions produce the desire result? | Goal 1: Increase attainment of degrees, certifications, diplomas, and other recognized credentials; Goal 2: Introduce or replicate innovative and effective methods for designing and delivering instruction; and Goal 3: Demonstrate improved employer outcomes. | Interviews Surveys Focus Groups Deliverable Review | Site Visits Surveys Deliverables | Spring 2016 Spring 2017 |
| In what ways did the implementation of the grant enhance institutional capacity? | Goal 1: Increase attainment of degrees, certifications, diplomas, and other recognized credentials; Goal 2: Introduce or replicate innovative and effective methods for designing and delivering instruction. | Interviews | Site Visits | Spring 2016 Spring 2017 |

## 2016 Evaluation Data

### Process

Baseline data was collected January – March of 2016 through individual interviews and a student focus group. Interview and focus group questions were designed by third party evaluators with the input of the project manager and tailored for the specific participant or group of participants (i.e. instructors, students). Seven key instructors were selected as interviewees as well as other staff being either fully or partially funded using grant resources or identified by the project manager as crucial to the successful implementation of the grant goals. Additionally, the evaluator facilitated a student focus group in which students from each of the advanced manufacturing programs were invited to attend by their respective instructors. The individual interviews as well as the student focus group interview were approximately one hour in length. All interviewees (with the exception of the students) were provided a copy of evaluator interview notes and given an opportunity to make corrections and/or to add comments. Interview and focus group data was reviewed to identify themes and patterns.

**Interview and Employer Survey Data**

**Interviewees**

- Project Manager
- Marketing Assistant, Business Partners Specialist, Career Pathways Coordinator – one position
- Education Technology Specialist
- Instructional Designer
- Retention Coordinator
- Online Success Coach
- Seven key instructors
- Seven students in focus group (4 first year students; 3 second year students)

Since LATI has a well-established process in place for surveying LATI graduates' employers, the decision was made to utilize these surveys for employer data.  The LATI employer surveys are sent out to employers of LATI graduates by the Department of Labor and Regulation representative housed on the LATI campus.  Employers are surveyed every other year and complete one survey in which they provide their satisfaction with all employees that are graduates of LATI.  The results of the employer surveys are used by instructors to address weaknesses in their programs of study identified by having an average score on any one question below 2.5 (out of 4.0) points.

The evaluation team was provided the average scores of the following advanced manufacturing programs:  Energy Operations and Technology; High Performance Engine Machining; Precision Machining.  Respondents were asked to rate LATI graduates currently employed by their company on seven questions and were also given an opportunity to provide comments.  The rating scale for questions 1 – 6 was a four point Likert Scale.  A response of 1 indicated "no, never"; a response of 2 indicated "sometimes"; a response of 3 indicated "usually"; and a response of 4 indicated "yes, always".  One-hundred ninety-five surveys were sent out to employers of LATI graduates in 11 programs and 66 surveys were returned for a return rate of 34%.  The total number of responses per advanced manufacturing program is listed below:

**Table 6: Employer Survey:  Number of Responses**

| Program | Number of Responses |
|---|---|
| Energy Operations and Technology | 4 |
| High Performance Engine Machining | 1 |
| Precision Machining | 4 |

**LATI Graduates Employer Survey (Spring 2016) Questions 1 – 6**

**Question stem:  Does the LATI graduate…**

1. effectively use information from a variety of sources?
2. communicate effectively through reading, writing, speaking, and listening?
3. analyze situations and demonstrate problem solving?
4. display appropriate interactions with clients and co-workers?
5. demonstrate the work habits you expect?
6. display the occupational skills you expect?

**Graph 1: Spring 2016 Employer Survey Results (Questions 1 – 6)**
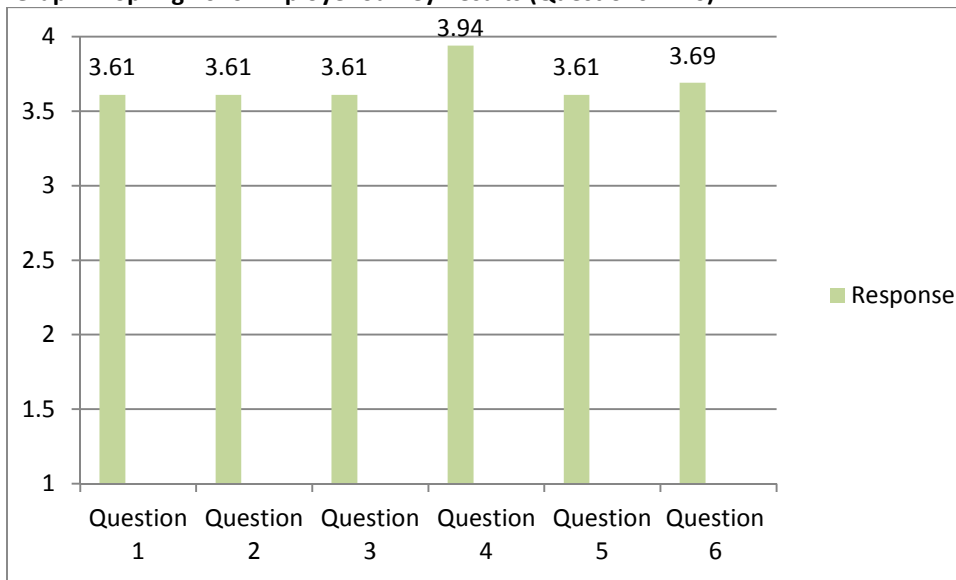


The final employer survey question asked employers to respond to their overall level of satisfaction with LATI graduates' technical preparation for successful employment.  The Likert Scale was a 3 point scale with 1 being "didn't meet expectations" and 3 being "exceeded expectations".  **The average response was 2.69.**

## Implementation Findings

### Enhancing Institutional Capacity

Enhanced institutional capacity was analyzed using interview data and can be seen in the six areas listed below:

1. Grant funds were used to hire two new advanced manufacturing instructors.
2. TAACCCT monies partially fund eleven full – time staff positions (Table 9; Page 21)
3. Server and storage capacity was upgraded.

4. Student services options were expanded including hiring an online student success coach.
   a. An online student success coach was hired to provide support to online students. This was a learning from previous rounds of TAACCCT grant implementation.
5. Facilitites were upgraded:  Permission was requested and granted to rennovate the welding area and add eight welding booths.  Currently welding accomodates two shifts of students, one in the morning and one in the afternoon.  With the addition of eight welding booths, enrollment is able to increase by 16 students.  Wind turbine issues have been worked out and the wind turbine is  being used as a hands-on lab experience for students.
6. Industry standard equipment was purchased. (Table 10, Page 21)

## Leveraging Previous TAACCCT Rounds

 TEAM SD leverages learnings and work from previous rounds of TAACCCT.  Many staff positions are expansions of positions that were created and/or utilized in a previous round of TAACCCT.  New positions have been created to fill needs identified in previous TAACCCT rounds.  Leadership conversations initiated during previous rounds of TAACCCT have led to policy development and improved student services.

## Strengthening Partner Involvement

Though LATI business partner input is crucial in program design and curriculum development efforts, other business partner contributions identified in the TEAM SD proposal include providing resources to support education/training and continuing to hire, promote and/or retain qualified program participants.  Strategies to involve business in these areas are in the process of being developed and implemented.  The LATI Employer Surveys indicate a high degree of employer satisfaction with the performance of LATI graduates.  A "Grow Your Own" business model is being piloted with a Sioux Falls business and conversations to expand this model to other businesses are underway.

## Program Design and Curriculum Development

The LATI advanced manufacturing curriculum provides students with experiences that mirror industry by using advisory board input, purchasing "industry standard" equipment, and using simulation/virtualization software.

## Student Support Services

LATI has a variety of student support services in place and project staff is well versed in accessing these resources. The "Early Warning System" employed at LATI may serve as one example.  All students are placed in a cohort and assigned an instructor advisor.  They are required to meet with their advisor at least once a semester.  Each program has an attendance policy and instructors monitor student absences.  Students with excessive absences are first visited with by the instructor.  If the instructor feels that more assistance is needed, they can call on the retention coordinator or guidance counselor.  As a last line of defense, the registrar is called.  Instructors also monitor grades.  In most programs any grade below 80% is a failing grade.  The Educational Services Center provides tutoring services to students who need additional help.

**Increased Enrollment in Advanced Manufacturing Programs**

Though it is encouraging to have increased enrollment in advanced manufacturing programs, this translates to increased work load for instructors and over-crowding in lab settings.

## Intervention/Activities

The TEAM SD project has made progress on each of the interventions identified in the Project Work Plan. The table below provides an overview of the progress made by the LATI TEAM SD project to date.

**Table 7: Progress on Project Activities**

| Goal One: Increase the attainment of degrees, certifications, diplomas, and other industry-recognized credentials. | |
| --- | --- |
| **Intervention/Activity** | **Findings** |
| Hire a marketing assistant to work with the advanced manufacturing industry and assist with the identification of employers' workforce needs, implementation of sector strategies, and the determination of a critical complex task. | A marketing assistant has been hired and interviewed by the evaluation team. During that interview, the marketing assistant shared that since he wears three project hats (marketing assistant, business partner specialist, and career pathways coordinator) he had not had time to devote to this aspect of his job. As previously discussed in this report, the newly hired (July 2016) business specialist has piloted a "Grow Your Own" business model with a Sioux Falls business and has begun discussions with an additional business located in Watertown and Sioux Falls. |
| Hire a Career Pathways Coordinator to accelerate the time to degree completion and employment through implementing the components of career pathways developed through the TAACCCT grant funded programs. | Under the direction of the previous Career Pathways Coordinator, all five career pathways have been developed with two pathways being posted on the LATI website. Discussions are underway to implement a competency-based education model which would allow students to accelerate the time to degree completion. |
| Create a marketing campaign utilizing a variety of formats to address employer workforce needs along with enhancing the advanced manufacturing workforce image. | The marketing assistant has created brochures, flyers, and videos which target a variety of audiences and focus on employer workforce needs. |

| Goal Two: To introduce and replicate innovative and effective models for designing and delivering instruction. | |
|---|---|
| **Intervention** | **Finding** |
| Hire a continuous improvement coordinator to develop new strategies, or replicate or adapt existing evidence-based strategies and use data for continuous improvement of programs. | This intervention is filled by LATI staff. Continuous improvement is a campus wide initiative involving all programs of study at LATI. |
| Hire content experts to expand the use of virtualization and simulation in advanced manufacturing courses. | This intervention is being accomplished using the expertise of instructors, the instructional designer, and the technology integrationist. The instructors are using their years of experience as teachers and experts in their fields of study to identify and select visualization and simulation software that mirrors industry level experience for students. The instructional designer and the technology integrationist assist instructors in identifying and incorporating powerful visualization and/or simulation software. |
| Leverage the Round 1 Student Success Toolkit and Round 2 Technical Education at a Distance (TED) Model to improve learning completion rates. | All Student Success Toolkit components implemented in TAACCCT Round 1 are still employed in TAACCCT Round 4. Additionally, an online student success coach is providing support to online students. The technology integrationist reviewed the TED Model to determine technologies that could be used to enhance the E-degree programs. |
| Improve the technology infrastructure support for educational programs provided by the grant. | LATI invested TAACCCT Round 4 funds to improve servers and expand storage space. Additionally, eight welding stations were added to accommodate the increasing enrollment of welding students. |
| Goal Three: Demonstrate improved employment outcomes | |
| Complete and publish an Employment Results Scorecard | The Employment Results Scorecard is update each year and published on the South Dakota Department of Education Website. It may be accessed at: http://www.doe.sd.gov/octe/postsecondary.aspx |
| Third party evaluation | Third party evaluation interim report will be completed and submitted on time. |

## Participant Impacts and Outcomes

### Collection and Design

The outcome/impact analysis design comprises document reviews including student registration and completion records, documents containing employment status of program completers, the Data Management System for tracking TAACCCT grant participants developed in TAACCCT Round 1, student questionnaires, and wage information provided through an agreement with the South Dakota Department of Labor and Regulation (DLR).

## Outcome Measure Analysis

**Table 8: Outcome Measure Target Attainment**

| Outcome Measure | Target | Actual/% of Total | Total |
|---|---|---|---|
| 1. **Total Unique Participants Served** | Year 1: 240<br>Year 2: 132<br>Year 3: 136 | Year 1: 291 (59%)<br>Year 2: 116 (80%)<br>Year 3: | **508** |
| 2. **Total Number of Participants Completing a TAACCCT-Funded Program of Study.** | Year 1: 50<br>Year 2: 78<br>Year 3: 81 | Year 1: 73 (35%)<br>Year 2: 86 (76%)<br>Year 3: | **209** |
| 3. **Total Number of Participants Still Retained in Their Program of Study (or Other Grant-Funded Program)** | Year 1: 135<br>Year 2: 193<br>Year 3: 159 | Year 1: 191 (39%)<br>Year 2: 193 (79%)<br>Year 3: | **487** |
| 4. **Total Number of Participants Completing Credit Hours** | Year 1: 225<br>Year 2: 117<br>Year 3: 121 | Year 1: 163 (35%)<br>Year 2: 200 (78%)<br>Year 3: | **463** |
| 5. **Total Number of Participants Earning Credentials** | Year 1: 50<br>Year 2: 94<br>Year 3: 81 | Year 1: 82 (36%)<br>Year 2: 98 (80%)<br>Year 3: | **225** |
| 6. **Total Number of Participants Enrolled in Further Education After TAACCCT-Funded Program of Study Completion.** | Year 1: 15<br>Year 2: 20<br>Year 3: 20 | Year 1: 26 (47%)<br>Year 2: 34 (109%)<br>Year 3: | **55** |
| 7. **Total Number of Participants Employed After TAACCCT-Funded Program of Study Completion** | Year 1: 12<br>Year 2: 19<br>Year 3: 20<br>Year 4: 20 | Year 1: 7 (10%)<br>Year 2: 28 (49%)<br>Year 3:<br>Year 4: | **71** |
| 8. **Total Number of Participants Retained in Employment After Program of Study Completion** | Year 1: 0<br>Year 2: 11<br>Year 3: 18<br>Year 4: 19 | Year 1: 0<br>Year 2: 28 (58%)<br>Year 3:<br>Year 4: | **48** |
| 9. **Total Number of Participants Employed at Enrollment Who Receive a Wage Increase Post-Enrollment** | Year 1: 73<br>Year 2: 75<br>Year 3: 78<br>Year 4: 39 | Year 1: 36 (14%)<br>Year 2: 71 (40%)<br>Year 3:<br>Year 4: | **265** |

## Outcome Measures Analysis

All outcome measures exceeded the year one and two targets with the exception of outcome measure 9, *Total Number of Participants Employed at Enrollment who Receive a Wage Increase Post-Enrollment.*

**Table 9: Positions Funded Using TAACCCT Grant Round 4 Funds**

| Position | % of Funding January 2015- June 2015 | % of Funding July 2015 – June 2016 | % of Funding July 2016 - Current |
|---|---|---|---|
| Grant Manager | 15% | 35% | 40% |
| Technology Integrationist | 35% | 35% | 45% |
| Instructional Designer | 25% | 25% | 40% |
| Business Partner Specialist | 40% | 40% | 50% |
| Financial | 20% | 20% | 35% |
| Marketing Assistant | 10% | 10% | ---- |
| IT User Applications | 100% | 100% | 100% |
| Electronics/Robotics Hybrid Instructor | 100% | 100% | 100% |
| Precision Machining Hybrid Instructor | 100% | 100% | 100% |
| Online Success Coach | ---- | 30% | 30% |

**Table 10: Equipment and Software Purchased Using TAACCCT Grant Round 4 Funds**

| Description | Department |
|---|---|
| Simulation Software – Plant Operations | Energy Operations Department |
| Rottler Diamond Cylinder Honing Machine | High Performance Engine Machining Department |
| Rottler Cylinder Head Seat and Guide Machine | High Performance Engine Machining Department |
| HP Store Virtual 4530 600GB SAS Storage | IT Department |
| HP Gen 8 Server | IT Department |
| High Speed Tiliting Sigma 5 2-Axis Rotary Table | Precision Machining Department |
| Yaskawa Motoman Robot | Robotics Department |
| 6 - RealCareer WELD Guidance System | Welding Department |

## Critical Partnerships

Lake Area Technical Institute has a strong relationship with industry partners.  Each program of study, including the five programs included in the TEAM SD project, meets with an advisory board comprised of industry leaders at least once a year.  The purpose of these meetings is for the industry partners to provide input on curriculum, industry trends, and feedback on the workforce preparedness of students. The newly hired business partner specialist has been working with businesses to establish a "Grow Your Own" training model.  A pilot program has been initiated with a Sioux Falls, SD business in which an employee can complete an e-degree in the Precision Machining Program of Study and the lab portion of the program will be taught on-site with an employee supervising the lab work.  Additionally, discussions are underway with another business with locations in Watertown and Sioux Falls to implement a similar model.

## Historical Data

The historical course analysis focused on three indicators: 1) enrollment, 2) graduation rate, and 3) time to completion and included courses in advanced manufacturing that were in existence for the three years prior (2011-2012; 2012-2013; 2013-2014) to the onset of the TEAM SD program. It is important to

note that the High Performance Engine Machining program was initiated during the 2013-2014 school year and no data for that program exits prior to that school year.

LATI provided the raw data for the development of the following charts that depict enrollment and graduation and retention data. Trend analysis of this data will be accomplished in the final evaluation report.

**Historical Data: Enrollment (Student enrollment is counted in the first year of enrollment)**

Table 11: Historical Data Comparisons

| Program | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|---|---|---|---|---|---|---|---|
| Electronics/Robotics | 28 | 35 | 39 | 44 | 66 | 69 | |
| Energy Operations/Tech | 62 | 34 | 39 | 37 | 49 | * | |
| High Performance Engine | ** | ** | 5 | 12 | 12 | 14 | |
| Precision Machining | 23 | 13 | 10 | 22 | 10 | 32 | |
| Welding Tech | 46 | 51 | 44 | 45 | 59 | 74 | |

*Enrollment data for Energy Technology was not provided for 2016-2017
**High Performance Engine Machining Program established in 2013-2014

Table 12: Historical Data Averages

| Program | Average Enrollment 2011-2014 | Average Enrollment 2014 - 2017 | Average increase |
|---|---|---|---|
| Electronics/Robotics | 34 | 60 | 76% |
| Energy Operations/Tech | 45 | * | * |
| High Performance Engine | ** | ** | ** |
| Precision Machining | 15 | 21 | 40% |
| Welding Technology | 47 | 59 | 26% |

*Enrollment data for Energy Technology was not provided for 2016-2017
**High Performance Engine Machining Program established in 2013-2014

**Historical Data: Graduation Rate**

The chart below depicts the number of the students enrolled in an advanced manufacturing program of study graduated or were retained in the program.

Table 13: Percent of Participants Graduated or Retained

| Program | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|---|---|---|---|---|---|---|---|
| Electronic Systems Tech | 9/12 (75%) | 5/12 (42%) | 3/6 (50%) | 3/7 (43%) | | | |
| Energy Operations/Tech | 46/62 (74%) | 16/21 (76%) | 17/25 (68%) | 11/18 (61%) | | | |
| Energy Technology | 37/51 (73%) | 11/14 (79%) | 14/18 (78%) | 8/11 (73%) | | | |
| High Performance Engine | * | * | 4/5 (80%) | 8/11(72%) | | | |
| Precision Machining | 20/23 (87%) | 11/13 (85%) | 5/10 (50%) | 15/22 (68%) | | | |
| Robotics | 3/9 (33%) | 5/7 (71%) | 7/13 (54%) | 7/11 (64%) | | | |
| Welding Technology | 42/46 (91%) | 41/51 (80%) | 35/44 (80%) | 41/45 (91%) | | | |

*High Performance Engine Machining initiated in 2013-2014

**Historical Data:  Time to Completion**

There are currently several structures that allow students to advance through course materials at a faster pace.  Those include testing out of course materials and skills, receiving credit for prior learning, receiving credit for transcript credits, and receiving credits for dual credits.  However, none of these options allow a student to complete a program of study in less time. Discussions are underway to put policies in place that would formalize the competency-based instructional model and allow students to move through programs of study more quickly.

## TEAM SD Project Operational Strengths

Two operational strengths surface when reporting on the progress of the TEAM SD project to date. TEAM SD leadership is leveraging learnings from previous TAACCCT grant work.  When implementing the student success strategies in the TAACCCT grant work, leadership discovered a missing focus; online students need different kinds of support than traditional students.  In order to address that need, LATI leadership hired an online student success coach to provide a focused support structure that addresses the unique needs of online students.

The newly hired business partner specialist has implemented a collaborative "Grow Your Own" business model with promising early results.  One Sioux Falls, SD, business (located 90 miles from Watertown) is piloting a process in which an employee is enrolled in an online program that will advance his skills.  He is taking the required lab portion of the program at his employment site and being supervised by an employer onsite.  Should this prove to be a success, this business is interested in attempting this model with additional employees and at least two other businesses have expressed interest in the "Grow Your Own" business model.

## TEAM SD Project Operational Weaknesses

Implementing competency-based education is proving to be more complex than originally thought. Putting instructional structures in place to accommodate competency-based education is not difficult. However, getting competency-based education issues to align with financial aid regulations and the Higher Learning Commission is proving to be more of a challenge.  Conversations are underway to address these challenges.

## Conclusion

The first goal of the LATI TAACCCT Round 4 program is **to increase the number of individuals earning credentials including degrees, diplomas and other certifications.**  The TEAM SD Statement of Work identifies a target of 225 credentials to be awarded to LATI students enrolled in advanced manufacturing programs of study over the four grant funded years.  At the end of the first two grant years, 180 LATI

students received credentials as a result of completion of an advanced manufacturing program of study which represents 80% of the target number.  TEAM SD has exceeded the targeted numbers to reach the identified goal by the end of the grant period.

The second LATI TAACCCT Round 4 program goal tasks grant recipients **to introduce or replicate innovative and effective methods for designing and delivering instruction that address specific industry needs and lead to improved learning, completion, and other outcomes for TAA-eligible workers.**  The TEAM SD work is implementing industry-standard equipment and technology in each of the identified advanced manufacturing programs of study. The "Grow Your Own" model is being piloted and options explored to replicate this model in other area businesses.  LATI advanced manufacturing programs of study are designed using business partner input and are constantly being revised to ensure the curriculum meets specific industry needs.  TEAM SD has made significant progress on goal two.

The third LATI TAACCCT Round 4 program goal calls for **improved employment outcomes.**  The identified activities for this goal are to complete and publish an Employment Results Scorecard and the Third Party Evaluation.  The Employment Results Scorecard is updated annually and is published on the South Dakota Department of Education website and the Third Party Evaluation Interim report will be completed and submitted on time.  TEAM SD goal three is on target to be completed by grant's end.