

SUNY TEAM TAACCCT Round 2

Final Evaluation Report

Report to:
Cortney Harris, Project Director
November 14, 2016

Hezel
ASSOCIATES

731 James Street, Suite 410
Syracuse, NY 13203
Tel: 315 422 3512
Fax: 315 422 3513
www.hezel.com

Hezel Associates, LLC, is a custom research, evaluation, and strategic consulting firm specializing in education. Since 1987, Hezel Associates has embraced its mission to serve clients with *intelligence, experience, and insight to enable them to succeed in creating, managing, and improving education initiatives.*

Hezel ASSOCIATES

Andrew Hayman, Senior Research Analyst
731 James Street, Suite 410
Syracuse, NY 13203
Tel: 315 422 3512
Fax: 315 422 3513
www.hezel.com
Andrew@hezel.com

© 2016 by Hezel Associates, LLC.

License



Unless otherwise specified, this work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Attribution and Citation

To attribute this work, use: Andrew Hayman.

To cite this work, use:

Hayman, A. (2016). *SUNY Training and Education in Advanced Manufacturing Evaluation Final Report*.

Hezel Associates, LLC, is an equal employment opportunity/affirmative action employer.

EXECUTIVE SUMMARY

The State University of New York (SUNY) Training and Education in Advanced Manufacturing (TEAM) is a 30-college partnership (23 of them receiving funding) with representatives from institutions across New York state. SUNY TEAM began in 2012 with funding from the U.S. Department of Labor (USDOL) Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program. SUNY TEAM aimed to standardize the core machining curricula that serves as the foundation for one-year certificate programs in four of the six technical tracks of Plastics, Welding, Optics, Photovoltaics, Precision Machining/CNC, and Mechatronics. SUNY TEAM developed curricula to support local and regional labor market needs, utilizing input from regional industry partners.

Implementation of the grant program was primarily successful, with the core machining curriculum being approved in Year 2, and other technical tracks being approved in subsequent years. Hezel Associates was contracted by Monroe Community College (MCC) at the beginning of the grant to provide formative feedback as well as a summative evaluation report to MCC and the USDOL at the conclusion of the four-year grant. The evaluation addressed both implementation and impact of grant funded strategies.

This report highlights evaluation methods and findings from all four project years. The following are conclusions generated over the course of the grant period, and are discussed in more detail within the report.

- SUNY TEAM leadership performed admirably implementing the grant, considering its size and scope.
- Although the internal curriculum development process for partner colleges was slow in some cases, the curriculum developed is of high quality according to stakeholders.
- Employers are engaged with partner colleges more than before the grant, and the need for qualified employees to fill positions still exists.
- Developing statewide PLA standards was a difficult task due to the scope but progress was made during the grant.
- ToolingU is an effective online resource if used to support traditional classwork.
- Facility upgrades provided a strong foundation for advanced manufacturing programs. The improvements will be felt by colleges and students for years.
- The impact of SUNY TEAM on student outcomes was difficult for researchers to quantify for multiple reasons, including a slower than expected curriculum development process by some lead colleges that resulted in low enrollment rates for new programs.

Based on these findings, Hezel Associates offers the following recommendations to the project team for moving forward (more details are provided within the report):

- Continue to adapt curriculum elements that suit colleges' local labor market and workforce needs.
- Maintain a statewide purpose.
- Market new and revised programs.
- Make finding qualified instructors a priority.
- Seek additional funding sources.
- Measure the impact of the new pathways.

TABLE OF CONTENTS

Executive Summary	3
Introduction	5
Methods	7
Instrumentation and Data Collection	7
Data Analysis	9
Findings	11
Program Implementation	11
Student Outcomes	22
Impact on Consortium Colleges	33
Conclusions	34
Recommendations	36
Limitations	38
References	39
Appendix A: Research Questions	40
Appendix B: Year 4 Instruments	41
Document Review Framework	41
Consortium In-Depth Interview	48
Employer Interview Protocol.....	52
Student Questionnaire.....	56
Appendix C: SUNY TEAM Work Plan	71
Appendix D: Student Questionnaire Respondent Profile	76
Appendix E: Outcomes Study Participant Demographic Profile	80
Appendix F: Milestone Checklist	82
Appendix G: Programs Included in Outcomes Study	85

INTRODUCTION

The State University of New York (SUNY) Training and Education in Advanced Manufacturing (TEAM) is a 30-college partnership (23 of them receiving funding) with representatives from institutions across New York state. SUNY TEAM began in 2012 with funding from the U.S. Department of Labor (USDOL) Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program. SUNY System Administration selected Monroe Community College (MCC) to serve as the grant's fiscal and management lead. The major goal of the SUNY TEAM is to support advanced manufacturing in New York and increase competitiveness in the global economy by creating industry-driven certificate programs. SUNY TEAM standardized the core machining curricula that serves as the foundation for four of the six technical tracks of Plastics, Welding, Optics, Photovoltaics, Precision Machining/CNC, and Mechatronics. SUNY TEAM developed curricula to support local and regional labor market needs, utilizing input from regional industry partners. Program staff focused on development of one-year certificate programs for the technical tracks listed above.

Over the four-year grant period, SUNY TEAM staff developed core curricula with supporting materials, customizable to regional labor markets. Each technical track is intended to be easily adoptable by community colleges throughout New York. Programs were designed for Trade Adjustment Assistance (TAA)-eligible workers, but are also accessible to other unemployed and underemployed individuals as well as other adults in each college's service area. The certificate programs require two semesters and students move through individual programs as part of a cohort. SUNY TEAM colleges employ a variety of support services including job placement assistance for students. In addition, most partner colleges have a SUNY TEAM coordinator on staff, who focuses on supporting student success by connecting program participants with needed services, as well as employers. A substantial component of the SUNY TEAM grant was facility improvement at some of the partner colleges.

MCC partnered with Hezel Associates in 2012 to provide external evaluation services for the grant period. Through a mixed methods approach, Hezel Associates has provided formative findings to further project improvement and to assist MCC in meeting USDOL requirements. The following report reflects final evaluation findings and recommendations generated from all four grant years, with a particular emphasis on new data from Year 4. Research questions are listed in Appendix A. The 23 grant-funded SUNY TEAM colleges are listed in Table 1. The curriculum development lead colleges are noted by technical track as well as the institutions with students included in the Annual Performance Report.

For the purpose of this report *project team* will refer to the grant leadership, including the project director, statewide coordinator, and others involved at the highest level of the grant. The consortium as a whole is referred to SUNY TEAM or the *project*. *Program* is used when referencing specific college programs (e.g., MVCC's mechatronics program).

Table 1. SUNY TEAM Consortium Colleges

Institution	Abbreviation	City	Region	Leads	APR
Adirondack Community College	ACC	Queensbury	Capital		
Broome Community College	Broome	Binghamton	Southern Tier		yes
Cayuga Community College	Cayuga	Auburn, Fulton	Central	Plastics	yes
Clinton Community College	CCC	Plattsburgh	North Country		
Corning Community College	Corning	Corning	Southern Tier	Welding (non-credit)	Credit programs on APR
Dutchess Community College	Dutchess	Poughkeepsie	Mid-Hudson		
Erie Community College	ECC	Buffalo	Western NY	CNC/Precision Machining	yes
Fulton-Montgomery Community College	FMCC	Johnstown	Mohawk Valley	Mechatronics	yes
Genesee Community College	GCC	Albion, Arcade, Batavia, Dansville, Lima, Medina, Warsaw	Finger Lakes		
Herkimer County Community College	Herkimer	Herkimer	Mohawk Valley		
Hudson Valley Community College	HVCC	Troy	Capital	Mechatronics	yes
Jamestown Community College	JCC	Jamestown, Dunkirk, Olean, Warren (PA)	Western NY		yes
Mohawk Valley Community College	MVCC	Utica, Rome	Mohawk Valley	Mechatronics	yes
Monroe Community College	MCC	Rochester	Finger Lakes	Optics	yes
Onondaga Community College	OCC	Syracuse	Central	Machining	yes
Orange County Community College	Orange	Middletown, Newburgh	Mid-Hudson		
Rockland Community College	RCC	Suffern	Mid-Hudson		
Schenectady County Community College	Schenectady	Schenectady	Capital	Mechatronics	yes
Suffolk County Community College	Suffolk	Selden, Brentwood, Riverhead	Long Island		
Sullivan County Community College	Sullivan	Loch Sheldrake	Mid-Hudson		
Tompkins Cortland Community College	TC3	Dryden	Southern Tier		yes
Ulster County Community College	Ulster	Stone Ridge	Mid-Hudson	Photovoltaics	yes
Westchester Community College	WCC	Valhalla	Mid-Hudson		

METHODS

Hezel Associates' theory-driven approach to evaluation emphasizes the linking of project objectives, activities, and participant outcomes. The data needed to meet the USDOL's requirements and answer questions related to SUNY TEAM project implementation and impact were collected and analyzed using a mixed methods approach, applying strategies specifically aligned with project activities and outcomes.

Instrumentation and Data Collection

Data collection activities were ongoing throughout the duration of the grant. Hezel Associates deployed various instruments in order to assess project implementation and impact. Instruments used in Year 4 are briefly summarized in the following section. Data collection instruments from Year 4 can be found in Appendix B.

Document Review

Hezel Associates developed the Document Review Framework based upon the work plan for the implementation of SUNY TEAM strategies. The framework is an outline of specific milestones for SUNY TEAM leadership and Hezel Associates to follow when comparing implementation against stated strategies and timelines. The work plan was divided into eight main strategies and 19 milestones. Documents used for analysis were collected from the project team. The documents detailed progress the consortium members made in Year 4 and included meeting agendas, service contracts, project announcements, curriculum materials, trainings and webinar attendance records, prior learning assessment overviews, and purchase orders.

Student Questionnaire

Hezel Associates researchers developed an online questionnaire in Years 3 and 4 aimed at former SUNY TEAM students to further explore their perceptions regarding their experience in their program. Only responses from the questionnaire administered in Year 4 are in this report. The 30-item instrument was revised to gather data on students' academic and demographic profile, employment outcomes, and student supports. Twenty items were multiple choice and focused on demographic information and participant profile data, including age, gender, current student status, college attended, and program enrolled. Five items were "Yes" or "No" questions relating to employment outcomes. Three questions utilized a 7-point Likert-type scale to assess program services, educational components, and students' expectations. Two additional questions were included about workplace behavior for the Educational Testing Service, another consultant working with SUNY TEAM. The data from workplace behavior questions are not included in this report.

Hezel Associates researchers crafted an email invite, including a questionnaire link for SUNY TEAM campus coordinators to forward to eligible students. The email described the purpose of the questionnaire, and included informed consent language. Only colleges with students enrolled in SUNY TEAM programs according to the 2015 Annual Performance Report were included. SUNY TEAM coordinators emailed the questionnaire link to former students in March 2016. Two reminders were sent to those who had not yet completed the questionnaire.

Consortium Member Interviews

Hezel Associates developed a semi-structured interview protocol, which contained 11 questions under 3 main topics: program design and curriculum, capacity improvements, and the future of SUNY TEAM. The open-ended questions were designed to obtain feedback from respondents regarding their perceptions of the organization of the consortium, how curricula for the educational pathways are being developed, and thoughts on sustaining the consortium in the future. Interviews were conducted with individuals contributing to the implementation of the SUNY TEAM project. The statewide SUNY TEAM coordinator provided a list of 26 consortium members representing 19 SUNY community colleges. Hezel Associates researchers emailed the 26 consortium members requesting an interview. The interviews were conducted over the course of three weeks in July and August of 2016. In total, 16 interviews were conducted with 17 individuals from 13 partner colleges. Most interviews were conducted with a single participant, but one interview was conducted with two participants. Interviews were recorded with the permission of the participants and transcribed later for analysis.

Employer Interviews

A semi-structured interview protocol was created by Hezel Associates. The protocol contained nine questions regarding employers' work with partner colleges. The open-ended questions were designed to obtain feedback from respondents regarding their perception of the organization of the consortium, how curricula for the educational pathways are being developed, contributions to SUNY TEAM programs, and thoughts on the future of the consortium. Interviews were conducted with those identified as part of the SUNY TEAM consortium. A list of 70 employers, representing eight schools, was provided to researchers responsible for developing SUNY TEAM curriculum: Onondaga, Corning, Cayuga, Erie, Monroe, Ulster, Fulton, and Schenectady. Lists of relevant employers were provided by the SUNY TEAM coordinators at each of the eight participating schools. Hezel Associates researchers recruited interviewees via email and conducted interviews over the course of six weeks between December 2015 and January 2016. In total, 11 interviews were conducted with 12 individuals from six partner colleges. Most interviews were conducted with a single participant, but one session included two participants. Interviews were recorded with the permission of the participants and transcribed later for analysis.

Participant Extant Data

Participant extent data were obtained in person, on a password-protected USB flash drive. The available data spanned from Fall 2014 to Spring 2016. The data came in long format, with multiple lines for each student. This data was restructured to wide format, resulting in one line per student. Hezel Associates researchers then manually aggregated individual-level data across the semester data submissions. Students who were high school students, cross-registered, or graduate students were excluded from the data. Student participant data, such as demographics (e.g., age, gender, race), special status (e.g., veteran, TAA-eligible), and academic performance (e.g., completion), were made available to Hezel Associates researchers from MCC. System wide data was provided to MCC by the SUNY System Administration's Office of Institutional Research and Data Analytics (SUNY IR). Data were also provided on full-time status, enrolled program and degree type, awarded program and degree type, campus, and graduation date.

The students counted in the APR were enrolled in credit programs at 13 colleges in the consortium. The data used to conduct the analysis included only credit programs (certificates and associate's degrees) at nine of the thirteen schools deemed to have been impacted by TAACCCT funds. Comparison group data were not available to share with Hezel Associates researchers because enrollment data were not available for non-TAACCCT programs. Wage data for SUNY TEAM were also not available due to New York Department of Labor (NYDOL) and SUNY regulations regarding personally identifying information.

Data Analysis

Analysis of data pertaining to the SUNY TEAM evaluation consisted of a variety of qualitative and quantitative methods, as detailed in the following sections. Data from each collection source were analyzed separately, and then compared for consistent or conflicting findings. Only analysis methods for Year 4 data are discussed here.

Document Review

Documents collected by Hezel Associates were analyzed by comparing them to the SUNY TEAM work plan. Each document was examined and its alignment with a strategy and/or activity was noted. After a review of all documents, judgments were made for each strategy and activity, regarding whether milestones were met and completed in the time period stated in the SUNY TEAM work plan. Important documentation was dated, which indicated when grant-related events occurred and included information that defined progress made towards the milestones laid out in the work plan. An overall assessment of milestones was done and results are available in Appendix F.

Student Questionnaire

Descriptive statistics were used to calculate frequencies for all questions. These frequencies served the basis for generating tables and several types of bar charts, including single bar and stacked bar charts, to summarize and graphically illustrate responses for each question. Where applicable, charts were ordered by highest percentage to lowest to show a ranking of selections made by the respondents. Data from the student questionnaires were used to answer research questions related to; (1) Implementation (1.2.4), (2) Program Design (2.2), and (3) Outcomes (3.1-4).

Demographic data were also collected along with the survey responses to develop a more detailed profile of the participants (e.g., gender, age, ethnicity, highest level of education, etc.). The student questionnaire respondent profile is available in Appendix D and contains the complete breakout of the responses to these questions, as well as demographic data such as eligibility status, motivations for enrollment, educational goals, semesters entered and graduated, and programs by college.

Employer and Consortium Member Interviews

Researchers used a preordinate scheme to guide the qualitative analysis from both sets of interviews. Through this approach, lengthy discussions were parsed into bits of content, which were fitted to the conceptual framework established by the questions of interest. Each excerpted bit was tested against not only the construct of interest, but also against the accumulating narrative content associated with it, applying a condensed constant comparative method to isolate each construct and clarify how it was labeled or coded (Dey, 1993). Researchers then identified logical linkages among the named constructs. These patterns became themes that explained semantic relationships among grant activities and outcomes for participants.

Participant Extant Data

Student participant data, such as demographics (e.g., age, gender, race), special status (e.g., veteran, TAA-eligible), and academic performance (e.g., completion), were made available to Hezel Associates researchers from MCC. Analysis consisted of frequencies of outcome measures by school, by program, and in the aggregate. Reporting these data by school and program enabled researchers to visually compare schools and programs to one another on their completion and retention rates and student demographics for populations of interest (e.g., veterans). Researchers cross-tabulated the number of completed certificates and credentials with variables including college, program, TAA-eligibility, age, gender, and ethnicity. Age was calculated by subtracting student birth year from the current year (2016). The data set did not contain information on participants who were retained (i.e., still enrolled) or not currently enrolled; thus, this information was inferred from other variables (e.g., enrollment date, graduation date). Researchers created variables to determine the number of students who completed a certificate or credential, did not complete and are not still enrolled, and did not complete and were still enrolled. For example, if participants had not yet graduated but were enrolled in the most recent semester (Spring 2016), then researchers considered them “still enrolled” (i.e., retained). If a participant had not yet graduated and was not enrolled in the most recent semester, researchers considered them “not currently enrolled” (i.e., withdrawn from the program). This created a “retention” variable that indicated which students completed, are still enrolled, or are not currently enrolled in the program. These data were then cross-tabulated with variables such as Tuition Assistance Program (TAP) grant recipients, Pell grant recipients, veterans, gender, and ethnicity to examine whether completion and retention rates varied across populations.

FINDINGS

The following describes findings for the entire four-year grant period. Results are presented by implementation and outcomes.

Program Implementation

The first three years of the evaluation focused largely on implementation, including the consortium organizational structure and management and the curriculum development process. The following section outlines implementation of the SUNY TEAM grant as it was originally designed, followed by a detailed description of the project as implemented.

Intended Implementation

The overarching goal of SUNY TEAM was to create programs that would help to improve retention and completion rates among consortium schools' students. SUNY TEAM intended to build the capacity of SUNY community colleges to support advanced manufacturing in New York by creating industry-driven certificate programs. The outputs of this effort were a core machining curriculum and developmental education curriculum along with the development, revision, or expansion of six one-year certificates to serve as educational pathways for students in the following fields: plastics, welding, optics, photovoltaics, precision Machining/CNC, and mechatronics.

The technical tracks were chosen based on labor market demands in the regions surrounding the seven colleges leading the development of curriculum. By aligning the curriculum with needs of employers around the state, participating colleges aimed to create a systematic set of stackable credentials employers need. The curriculum was intended to be high quality, integrating employer input and state-of-the-art equipment for training. Once developed, the final curriculum materials were to be made public through an Open Educational Resource (OER), which was accessible to other SUNY colleges. They could easily locate and use individual materials, courses, or entire technical tracks.

The seven colleges designated as "leads" were tasked with developing, revising, and/or expanding curriculum and received funding for personnel, equipment, labs, and more to create replicable programs for sharing with other SUNY community colleges. The chart delineates the seven schools responsible for curriculum development plus the partners for Mechatronics.

Table 2. Curriculum Development Responsibilities

School (Lead/Partner)	Technical Track
Onondaga (Lead)	Core Machining
	Developmental Education
Cayuga (Lead)	Plastics
Corning (Lead)	Welding
Mohawk Valley (Lead)	Mechatronics
Schenectady (Partner) (Original lead)	
Hudson Valley (Partner)	
Fulton Montgomery (Partner)	
Monroe (Lead)	Optics
Erie (Lead)	CNC Precision Machining
Ulster	Photovoltaics

Schenectady was the original lead for nano-conductor/semi technology. Due to shifting employer needs, the focus became mechatronics and they partnered with other colleges (MVCC, FMCC, and HVCC) to develop that curriculum. The other 16 participating schools received funding for equipment, supplies, or support services of various amounts, but the amount received by the other schools was smaller than the lead schools.

In addition to curriculum development, SUNY TEAM set out to expand partnerships with workforce and industry partners across the state. This collaborative effort intended to develop an ecosystem of advanced manufacturing around the state to support the new educational pathways. The new curriculum and facility upgrades would be supported by a network of other partners to provide technical training for TAA-eligible students and other adults, which would also address the needs of various industries in New York. The eight strategies outlined in the SUNY TEAM work plan are listed below. The complete work plan can be found in Appendix C.

- Strategy 1: Develop and promote career pathways in advanced manufacturing with clear entry and exit points to meet trainees' education and employment needs.
- Strategy 2: Build and offer uniform core and specialty curricula based on the DOL competency model incorporating National Association of Manufacturers (NAM)-endorsed Advanced Manufacturing.
- Strategy 3: Validate new and existing curriculum with industry and industry associations at the local, state, and national levels.
- Strategy 4: Build and offer fast track developmental education curricula in support of Advanced Manufacturing programming.
- Strategy 5: Offer core, specialty, and developmental education courses via online and other alternative delivery formats.
- Strategy 6: Build and offer uniform statewide system for awarding academic credit through prior learning assessment.
- Strategy 7: Provide centralized student services through campus-based TEAM Centers working in partnership with the public workforce system.
- Strategy 8: Build and implement a coordinated statewide approach to outreach, recruitment, and Earn and Learn models for the Advanced Manufacturing industry.

Implementation Summary

Actual implementation of the SUNY TEAM was close to what was intended, with some deviations. An accelerated curriculum approval process implemented by SUNY and NYSED was effective at reducing the standard approval times for new and revised curriculum. However, curriculum development was delayed for two reasons. First, the project director and statewide coordinator were not hired until the summer of 2013. Second, the internal curriculum development process for each of the lead colleges was different. In most cases, multiple internal approvals were required before new or revised curriculum could be submitted to SUNY and NYSED. As a result, not all milestones could be attained or accomplished within the prescribed timeframe. According to the 2015 APR, SUNY TEAM exceeded target goals by serving 4,243 unique participants across 13 colleges during the first three years of the grant. Considering the size of the consortium and the difficulty of realizing some of the strategies, SUNY TEAM performed admirably in implementing the grant.

The following sections detail the implementation in terms of management and the eight strategies listed in the work plan. The evidence provided was derived from documentation review, consortium member interviews, employer interviews, and student questionnaires. Although the grant included 23 schools who received funding, most of the data collection was focused on the 13 colleges listed in the APR because of their larger role in grant activities and the findings reflect that fact.

Management. The grant was managed by the project team at MCC and SUNY System Administration, who coordinated high-level grant activities, facilitated deliverable completion, and established financial procedures to ensure USDOL compliance. The management team consisted of the project director (from MCC), responsible for overseeing SUNY TEAM; the statewide coordinator (from SUNY), responsible for facilitating the curriculum approval process at SUNY; an operation coordinator (from MCC), who guided the financial aspects of the grant; the college coordinators; the steering committee; and other team leads as necessary. The management team held monthly phone conferences with partner colleges over the course of the grant, facilitated by the project director. The topics of these calls were specific to the grant stage and were intended to provide status updates to all members and allow opportunities to work through any issues that needed attention. Topics included curriculum development, staff hiring and contracting, grant policies and procedures, and other pertinent items. These phone calls were most helpful for consortium members who were recently hired to assist with the grant; they provided a forum to answer to college specific questions. When asked about SUNY TEAM leadership, consortium members were complimentary about the organization and communication. The only concerns expressed by consortium members came from those representing schools that had received very small amounts of funding, who felt they were not kept abreast of grant activities as much as they could have been. By and large, consortium members were satisfied with grant leadership.

The steering committee also played an instrumental role in the coordination of grant activities across colleges and served in a shared governance role that included high level officers from partner schools, representatives from the Manufacturers Association of Central New York (MACNY), and the SUNY statewide coordinator. Further, this group played a major role during the middle years of the project when changes needed to be made to grant activities. Memoranda of understanding between partner colleges as well as multiple budget modifications were required. The steering committee was responsible for making decisions about shifting money from schools that needed it less to colleges that needed more funds. This process was very transparent and, even though MCC served as the fiscal agent, funds were distributed with the best interest of SUNY overall.

In terms of communication with all partner colleges, the management team employed a variety of methods. A file sharing system was established on Wiggio, where all procedural documents, and technical team information, could be shared. Wiggio was used during the grant period to share documents, but was used less in the final year. Periodically, guidance was provided by the *project team* to the other colleges, covering items such as budgeting instructions, reporting templates, outreach material creation guidelines, and curriculum development direction. A SUNY TEAM conference was held each year. These brought together representatives from the

23 colleges that received funding, allowing them to interact face-to-face and share best practices and ideas. This event was also a forum for progress on action items, such as curriculum development, providing technical teams an opportunity to work through issues and update the other members of the grant.

In interviews throughout the grant period, the management team was praised for being organized, keeping project staff on track with deliverables, and maintaining frequent and effective communication amongst members. The project director, operations coordinator, and statewide coordinator were instrumental to the completion of grant deliverables. Overall, the grant was well managed.

Strategy 1

In terms of the project work plan, the start-up of coordination, policies, and procedures were all completed, with some completed slightly behind schedule (Milestone 1). SUNY TEAM experienced delays from the outset of implementation, resulting from the hiring process taking longer than anticipated at MCC, SUNY System, and partnering schools; most coordinators were not hired until 2013. Despite these delays, SUNY TEAM held one consortium wide meeting in April 2013 to organize the partnering community colleges and share progress reports from each of the schools. By the end of Year 1, community college staff had been working toward having all necessary program staff hired. Progress on forming all the necessary curriculum development groups for the six educational pathways was also underway.

A number of different employers were involved in early discussions regarding the direction for the curriculum of the technical tracks; however, in some instances, larger companies could hold more influence than others (Milestone 2). Employers continue to have formal meetings with colleges bi-monthly or quarterly, in most cases. For example, SUNY staff and industry employers representing various companies convened for a Cortland Plastics Manufacturers meeting to discuss key issues (i.e. skills needed, potential positions, program design, and future program plans). Similar meetings took place in other regions with regard to other programs.

OCC was the lead for both the developmental education and core machining components of the grant. The semi-conductor/nanotechnology development group, led by one of the mechatronics leads, Schenectady, began work towards identifying industry needs, while the other educational pathway leads began outreach activities to form their curriculum development groups. Curricula contained consistent core content within each track, as stipulated in the proposal, with some track-specific credits embedded due to regional industry demand. Also, curriculum was approved by employers and industry groups for all six technical tracks. Some employers that were less involved noted that a few colleges were inconsistent with communication, while others noted that involvement was too much of a time commitment.

Milestone 3 focused on rolling out the educational pathways to the colleges and WIBs to market the programs. Once core machining was approved, new programs could be revised or created using the elements of the curriculum. The new and revised programs were designed to ladder into existing two-year degree programs. See Table 3 for the approval dates of new curricula by SUNY and the New York State Department of Education (NYSED). ECC did not make curriculum revisions that required approval from SUNY and NYSED. Once programs were

approved by NYSED and SUNY, colleges and WIBs began to market SUNY TEAM programs. SUNY TEAM developed a marketing strategy in Year 3 (Milestone 3), providing kits for each school to use to advertise the programs. Newspaper and radio ads were utilized as well as brochures and print materials that were made available at WIBs and around college campuses. Consortium members and employers stressed the importance of the marketing to support the sustainability of the new and revised programs.

Table 3. Lead Colleges Approved Curriculum

School	Technical Track	Type	Status (SUNY)	Status (NYSED)
Onondaga	Core Advanced Manufacturing	1-year cert.	Approved	Registered (6/20/14)
Cayuga	Plastics	1-year cert.	Approved	Registered (1/30/15)
Corning	Welding	Non-credit cert.	Approved	Not needed
MVCC	Mechatronics	1-year cert.	Approved	Registered (6/26/15)
Monroe	Optics	1-year cert.	Approved	Registered (3/4/16)
Erie	CNC Precision Machining (existing)	1-year cert.	Not needed	Not needed
Ulster	Photovoltaics	1-year cert.	Approved	Registered (6/22/16)

Four new technical programs were developed and approved (if needed) in 2014 and 2015; however, two of the technical programs were revised but not approved until 2016 of the grant period. Curriculum development was delayed for a myriad of reasons, including changes in industry and employer needs, hiring delays, and a sometimes lengthy internal curriculum development process of partner colleges. All pathways were approved and implemented later than their intended due date, as expected given the previously identified delays. Table 4 details the new and revised program created with curriculum developed through the grant. Some will not begin enrolling students until Fall of 2016.

Table 4. Certificates/Degrees Created or Revised

School	Name of Certificate or Degree	Type	Ladder	New/Revised
Onondaga	Advanced Manufacturing - Machining	1-yr cert.	Mechanical Technology A.A.S.	new
Cayuga	Plastics	1-yr cert.	Mechanical Technology A.A.S.	new
	Advanced Manufacturing - Machining	1-yr cert.	Mechanical Technology A.A.S.	new
	Industrial Maintenance	1-yr. cert	Mechanical Technology A.A.S.	new
Corning	Welding	cert.	Non-credit	new
FMCC	Automation Systems - Mechatronics	1-yr. cert	Electrical Technology A.A.S.	new
HVCC	Semi-conductor Manufacturing Tech.	A.A.S.	*added mechatronics courses to existing program	revised
MVCC	Mechatronics	1-yr cert.	Electrical Service Technician A.O.S.	new
Monroe	Precision Machining - Optics	1-yr cert.	Optical Systems Technology A.A.S.	revised
	Mechatronics	1-yr cert.	Mechanical Technology A.A.S.	new
Erie	CNC Precision Machining	1-yr cert.	Industrial Technology A.O.S.	existing
Schenectady	Mechatronics	1-yr cert.	Nanoscales Material Technology A.A.S.	new
Ulster	Industrial Technology (PV Focus)	1-yr cert.	Industrial Technology A.A.S. and A.S.	revised

In addition to curriculum, consortium members were excited about the facility improvements made possible by TAACCCT funding. Interviewees explained that the new equipment is

essential to allow colleges to offer relevant advanced manufacturing curricula. Updated technology serves as a foundation for advanced manufacturing in the state of New York, so community colleges can prepare students adequately for future employment. Enthusiasm for the technological improvements at Corning was described as an “avenue to grow enrollment.” Specific pieces of equipment identified by consortium members included protractors, a CNC polisher, a CNC grinder, and programmable logic controllers. Many interviewees believe the new technology is one of the most substantial outcomes for partner colleges, allowing students or incumbent workers to receive hands-on training with the actual equipment used by employers. Consortium members purchased equipment that aligned with their programs, utilizing input from employers and industry partners. Employers have helped to identify equipment necessary for the programs to be successful and, in some cases, donated the equipment themselves or inspected the equipment that was purchased by the schools. One concern expressed by multiple employers and consortium members, was the ability to have qualified instructors to teach the new programs. Instructors require a certain amount of experience in the industry to have the ability to teach students, especially on the updated equipment.

By the close of Year 4, SUNY TEAM leadership met nearly all milestones of Strategy 1, but did not meet most of them within the intended timeline due to delays in the hiring process and individual colleges’ curriculum development processes. SUNY and NYSED worked together to expedite the process. Normally, the process of approval takes 6 months to 1 year from the time of formal submission to SUNY System’s Office of Academic Planning to the registration of the program by NYSED. This was greatly reduced for SUNY TEAM technical tracks, with many programs obtaining formal approval within 1–3 months from submission to SUNY campuses or the approval process of NYSED. Evidence received throughout the first three years of the project indicated that SUNY TEAM leadership took the appropriate steps to complete this strategy. All funded development programs were completed and registered (if needed) during the four-year grant cycle.

Strategy 2

By the end of Year 2, SUNY TEAM leadership had already completed most of Milestone 1 of this strategy, which focused on curriculum development and core course piloting. They did so by finalizing curriculum development across the colleges and industry partners and obtaining industry feedback for the curriculum.

When interviewed, employers were extremely satisfied with the new curriculum across the technical tracks. Employers believe the curriculum and program design incorporates the hands-on experience they require, while also providing students with an understanding of logic and decision-making needed in advanced manufacturing. The curriculum advisory boards assisted in developing a program that suits the needs of multiple employers in the area. This will ensure that students who complete the program have options for employment.

Other successes in the curriculum development process included Optics and Precision Machining working together at MCC to develop programs that address very specific industry needs. Optics companies are looking for employees with the skill sets of machinists, who can use those skills on glass instead of metal. All of the technical tracks, with the exception of welding, ladder into two-year degree programs (Milestone 2). Existing programs are being marketed to prospective students and structures are in place to begin marketing new programs pending approval of

curricula. Additionally, Dutchess and Ulster collaborated to develop a non-credit Certified Production Technician (CPT) Certificate that they hope to convert to credit in the future. Rockland shared an instructor and training materials with Dutchess as well. Partner colleges are creating both credit and non-credit certificate courses and programs that link to degrees. Other schools are looking to strengthen the connection between credit and non-credit programs.

Strategy 3

All new and revised curricula were developed and approved with industry association input, as denoted in all curricula forms 2Cs and 3As, which are the required documents for submission to SUNY, respectively, for new and revised curricula to be approved (Milestone 1). As indicated in a 2013 signed contract with MACNY, SUNY TEAM continuously partnered with MACNY and industry employers in the curriculum validation process. As a consultant, MACNY served on the steering committee and participated in finalizing a work plan, functioned as a subject matter expert, confirmed the training and certification needs of employers, and identified and monitored industry trends. Outcomes of this partnership included activities like MACNY's assistance with staffing advisory boards and curriculum committees, identification of skill gaps and workforce needs, working with faculty to review and validate curriculum, working with employers and colleges to expand employment opportunities to trainees, and providing training and education in advanced manufacturing. Employers were very satisfied with the industry advisory boards and in most cases were happy to be asked to participate. Organizations, like the Council of Industry, played a pivotal role in the curriculum development process. Nurturing these types of relationships should remain a focus after the grant.

In addition, throughout the grant period, Educational Testing Services (ETS) provided services aimed at understanding the psychological factors of the adult learner (Milestone 2). More specifically, ETS provided consulting services that focused on measuring workplace readiness skills of students undergoing career training, assisting instructors with understanding skills profiles of students that are relevant to future workforce success, and helping faculty identify learning objectives pertinent to student workplace success. ETS developed a computer-delivered, adaptive assessment that measured students' behavioral skills relating to communication and teamwork, enthusiasm and attitude, problem solving and critical thinking, and professionalism. Finally, they conducted workshops and provided reference materials for instructors and faculty to help inform coaching, development, and other instructional activities associated with these critical work and success dimensions. Overall, these activities are evidence that SUNY TEAM has demonstrated completion of Strategy 3 in accordance with the established timeline.

Strategy 4

The first milestone was completed May 1, 2013. SUNY TEAM leadership provided curriculum outlines for developmental math and writing courses. In addition, evidence of developmental education curriculum meeting minutes; presentations for math, reading, and English developmental education; and marketing materials for student workshops further supported completion of this milestone. All evidence was in accordance with the proposed May 2014 deadline. Though proposed activities had already been met by Year 3, evidence demonstrates that SUNY leadership continued to engage in efforts that further strengthened implementation activities. SUNY TEAM staff worked with a consulting instructional designer, from July 2014 through September 2015. During this period, the consultant conducted webinars on topics like

self-paced learning, adult learning strategies, creating connections to industry and creative ways to assess student learning.

SUNY TEAM leadership provided documentation to show that a combination of the Integrated Basic Education and Skills Training (I-BEST), Accelerated Learning Program (ALP), and Research Institute for Studies in Education (RISE) models were recommended for the Developmental English/Reading curricula. A concept document for developmental math education discussed the use of the I-BEST model for accelerated developmental math education and the RISE program model for math workshops. Math workshops began in May 2014, indicating that SUNY TEAM leadership developed a common understanding close to the proposed deadline of January 15, 2014 in order to be ready to offer the workshops in May.

OCC in Syracuse, NY is leading the Developmental Educational curriculum committee with representation from other community colleges who were interested in participating in the development efforts. The committee began with four models: I-BEST, RISE, ALP, and Quantway. Milestone 2 was expected to start October 2013 and continue throughout the duration of the project. OCC faculty and SUNY TEAM leadership, tasked with leading the design of the developmental education curriculum development, had been working with several schools as early as April 2013. The approved developmental education curriculum is non-credit and is now available on creative commons.

Overall, SUNY TEAM leadership were able to complete the two milestones of Strategy 4 within the expected timeline, finalizing developmental education course selection and continuing efforts to collaborate and share practices.

Strategy 5

The two milestones of Strategy 5 focused on improving IT infrastructure by June 2014 and establishing a Manufacturing Worker Learning Community by September 2014. Hybrid courses are being implemented by some partner colleges, where students can use the new technology. Interviewees insisted that hands-on experience is the crucial element of any advanced manufacturing program. To supplement hands-on training, a new addition to some SUNY TEAM college programs is the use of ToolingU, which offers online modules for specific courses to help students reinforce what they learn in class. ToolingU was implemented in October 2013 and rolled out to four schools and eight programs. Consortium members interviewed that currently use ToolingU at their campus spoke highly of the software. Some interviewees would like to expand its use in other programs.

SUNY TEAM leadership also provided evidence about which schools were switching to Blackboard, an online educational administration tool, as of April 2014. In addition, evidence indicates that the OpenSUNY website is up and running, launched in January 2014. Moreover, documentation provided in Year 3 shows they have made progress toward establishing a Manufacturing Worker Learning Community. MCC and Cayuga, contracted with Learner Web, an online learning support system, showing completion of this milestone within the timeline. Further, a contract with consultant showed that instructional design services, including those specific to online paradigms, were provided to consortium members. Part of these services included webinars on course development best practices, state-of-the art delivery methods, and

creating scripts for online modules. In addition, instructional design support and coaching were offered in person to each of the leading colleges. These trainings equipped instructors with the techniques needed to successfully support online course delivery.

Staff offered additional documentation in Years 3 and 4, further demonstrating the embedding of certifications within approved curricula. An example that supports these certification integrations is an agenda of the MSSC training received by instructors during their certification process, which authorized and ultimately informed their instruction of this model in the curriculum. Overall, SUNY TEAM leadership was successful in completing the milestones of Strategy 5 within the timeline.

Strategy 6

The task of creating a statewide PLA system for all SUNY community colleges proved to be difficult, because of the differences in PLA policies for colleges across the state. The discussions regarding a standardized PLA system involved many stakeholders, including partner colleges and Empire State College, to collaboratively discuss potential policies (Milestone 1). SUNY TEAM leadership was expected to create statewide policies by May 2014 and complete the remaining milestones by September 2014. As of Year 2, a PLA website, philosophy and principles and advisory board were established, with board meetings held in January and February of 2014. Empire State College is responsible for maintaining PLA information. The advisory board completed a Recommendation Report in April 2014, which provided suggestions for previously established SUNY PLA policies. However, a statewide policy has not been implemented, but, in an effort to establish systematic consistency, selected industry trainings and certifications and their corresponding course credit recommendations were outlined (Milestone 2).

Staff from all TAACCCT funded consortium colleges identified available prior learning and competency-based assessments to identify students' allowable skills in Year 2, which is the third milestone of this strategy. In Year 3, SUNY TEAM leadership provided a PowerPoint presentation in August 2015 on the types of acceptable PLA (Milestone 4). Along with this presentation, staff also provided presentation slides from PLA professional development sessions from August and September of 2015. In Year 4, SUNY TEAM leadership announced professional learning evaluations as a newly approved PLA option (Milestone 3). This assessment addition further satisfies Milestone 3 of this strategy. In an effort to establish a statewide system for evaluating this PLA type, a faculty team led by Empire State College evaluated all advanced manufacturing certifications. Subsequently, a total of eight Advanced Manufacturing Professional Learning Evaluations were developed and are now available for use toward the transfer of credits across SUNY and other institutions. Finally, Empire State College released an open source website named National Resource Center for Prior Learning. This site serves as a unique form of professional development, because it provides the tools and resources needed to design and fully implement PLA programs to colleges and universities across SUNY and beyond.

Though evidence was not aligned with the timeline, this delay was expected due to the scope of creating a statewide system for evaluating PLA in New York. Overall, however, staff

demonstrated successful development and implementation of statewide prior learning assessment policies and procedures.

Strategy 7

The two milestones of Strategy 7 focused on establishing TEAM Centers and integrating support services from local organizations and were expected to be complete by June 1, 2014. As of the annual SUNY TAACCCT Consortium meeting in April 2014, a TEAM Center was established at Cayuga. This task demonstrated progress towards the milestone, according to the timeline; however, there is a lack of evidence showing establishment of TEAM Centers at other colleges. Evidence indicates that many colleges devoted resources to workforce development, which may not be officially titled as a TEAM Center, making tracking with documentation difficult. Similarly, it is presumed that a Learner Web coordinator has worked with the consortia partners to implement a web-based support system on campuses. The Learner Web software supports case management of students, tracks training and academic progress and provides on-demand support, guidance, and resources. In addition, Learner Web integrates support services from local One-Stops, colleges and community based organizations. The latter activities align with the second milestone, which expands on the development of these centers, focusing on integration of local organizations' support services. Learner Web was used by a few schools, but, from evidence, it is difficult to determine how effective it was and the extent of its use. Additional evidence for this strategy included a contact list of TAA coordinators and a webinar on how to recruit organizations to partner with the colleges. Though not yet complete, this evidence indicates that staff has made progress towards meeting the milestones of Strategy 7. Interviews with consortium members found that a concern moving forward, will be finding adequate sources of funding for students to enroll in programs. Even though programs are not thought to be expensive, some students have trouble affording courses.

Evidence from interviews with consortium members shows that support services are offered to TAACCCT students in both credit and non-credit programs through various avenues. The services available to TAACCCT students are typically the same services offered to the greater student population at each college. However, some colleges have designated a case manager or counselor to work with TAA-eligible students one-on-one. In most cases, career services and counseling will be provided to TAACCCT students through each college's appropriate program department (e.g., Continuing Education, Workforce Development) or general student services office. Colleges work very closely with their local WIB, who assist colleges with recruitment, career fairs, placement testing and job placement. In addition, soft skills are at the forefront of employers concerns about hiring new employees. Time management, communication, and working together in teams are vital to a student's success once hired. Employers assess those skills during the interview process, and support services need to address those areas.

A questionnaire was used to ask students to rate certain aspects of SUNY TEAM programs. Respondents rated components of their program on a 7-point Likert scale ranging from *Very Satisfied* to *Very Dissatisfied*. The percentage of respondents that selected *Very Satisfied* or *Satisfied* is displayed in Figure 1. Instructors, hands on experience, and student services were all highly rated by respondents. Job shadowing, internship opportunities, and learner web were the lowest rated program components by respondents. The *Does Not Apply* option is not factored into the percentages.

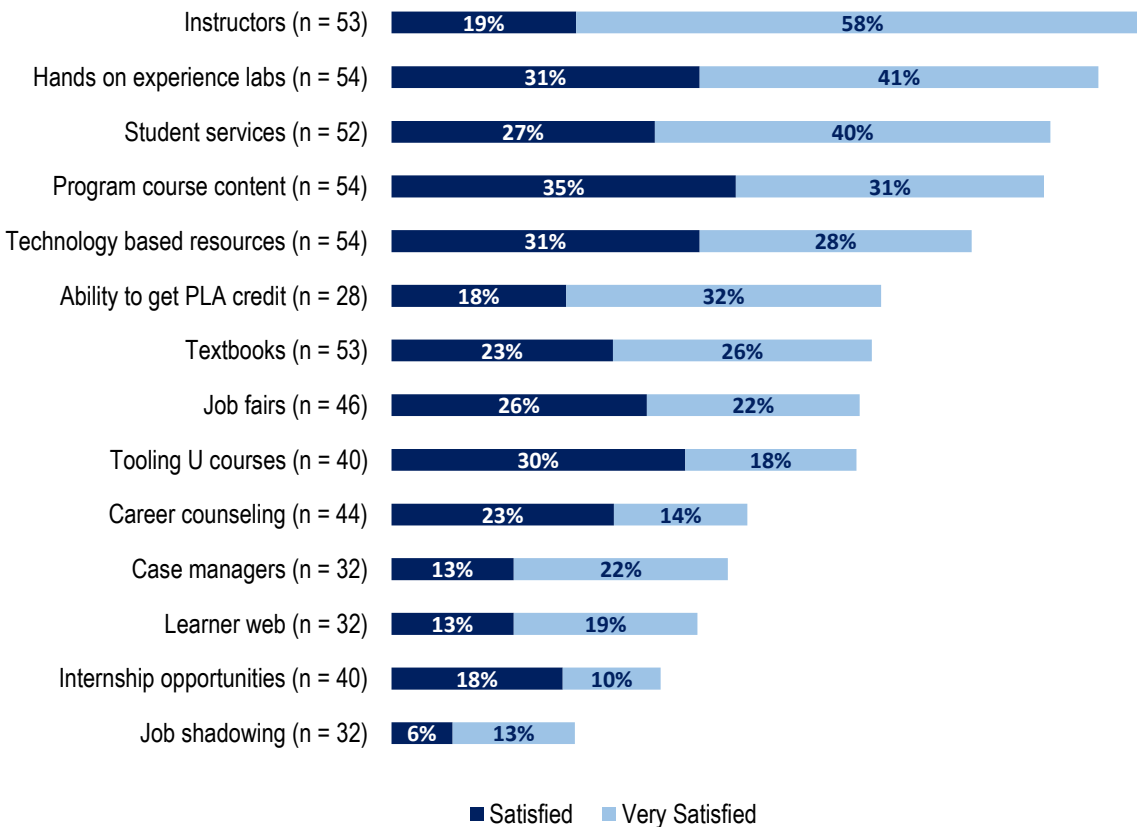


Figure 1. Satisfaction with Specific Program Components

Strategy 8

The first milestone, “Job fairs conducted and employer networking sessions to increase connections between employers, participants, and community colleges, WIBs/One-Stops,” had a deadline of September 1, 2014. The evidence provided by SUNY TEAM leadership demonstrated completion of this milestone within the expected timeline. Some notable accomplishments included: MACNY Science Technology Engineering Math (STEM) Career Day and Leadership Forum held by MVCC as an outreach event; preparation for a career fair by Cayuga, which also collaborated with two Board of Cooperative Educational Services (BOCES) for additional lab space; and collaborative partnership development, job fair planning, and marketing by Orange. In addition, several webinars were conducted to reach out to the veteran population.

SUNY TEAM addressed the second milestone when they partnered with Finger Lakes Advanced Manufacturers’ Enterprise (FAME) consultants, who helped promote the 5% Pledge program. In this program, regional business leaders are asked to increase their workforce by five percent through hiring temporary workers. The objective of this endeavor is to expose workers to the manufacturing culture, highlight the high-tech capacity and future opportunities available in manufacturing and emphasize the skills needed to be successful in the industry. Consultants recruited business leaders and worked with the local workforce boards, career centers, and

educational institutions to fill available positions. As a result of these partnerships, potential employment opportunities were made available to students completing degrees in the advanced manufacturing field. According to meeting minutes from August 2014, Ulster paired up with their local BOCES to offer MSSC-CPT as a “non-credit initiative for workplace readiness.” SUNY Orange introduced a new non-credit Construction Gas Technician training program, an innovative partnership between SUNY Orange and Precision Pipeline Solutions, LLC, which provides training for their employees. In addition, the SUNY Works website was launched, which will increase coordination for Earn and Learn.

Consortium members emphasized the importance of existing relationships developed prior to SUNY TEAM, because they were influential in the implementation process. For example, the Hudson Valley Council of Industry and a separate consortium for clean energy in the Hudson Valley are continuously involved with colleges in their region because of the commitment to advanced manufacturing propagated by TAACCCT funding. SUNY TEAM was a catalyst for new consortia to develop in Oswego County, according to one interviewee. The grant has strengthened old relationships, while creating new ones, connecting advanced manufacturing programs throughout the state. It is important for SUNY TEAM to leverage those relationships to sustain the momentum of SUNY TEAM after the grant. Employers are hopeful that the continued partnerships will reduce the amount of training time they spend on new hires in the future.

Each college and technical track has multiple companies who contribute to programs in many ways: advisory board members, curriculum reviewers, guest lecturers, liaisons between the colleges and industry associations, college course instructors, equipment donations, and mock interviews to help students prepare future employment. Some employers offer internships; others allow students to tour their facility or share a lab. In some cases, employers serve as part-time instructors at the college. There is concern amongst employers and consortium members that there may be a shortage of instructors in the future as the new programs expand across the state.

Consistently throughout the grant period, employers associated with SUNY TEAM have been pleased with the programs in terms of content and structure, the relationships they have formed or strengthened with the colleges, and the program completers they have hired. However, many of them noted the “bureaucracy” of the education system differs from the private sector, and may have caused some of the delays in terms of internal curricula approvals at partner colleges.

Student Outcomes

Student outcomes are presented in the following section in two ways. The first section will focus on seven certificate programs or technical tracks that utilized curriculum developed through grant funds. The APR outcomes section will address 33 certificate and degree programs that were affected by grant funds across nine of the twelve colleges reported in the APR. This section includes technical track certificate programs as well. The complete list of programs analyzed is available in Appendix G.

The data provided to researchers contained individual-level enrollment information for students enrolled in an advanced manufacturing certificate or degree program from nine SUNY TEAM schools. The list of schools and programs included in the outcomes study is denoted in Appendix

G. The data provided were for academic terms from programs from Fall 2014 to Spring 2016; however, some colleges had not reported their degree numbers awarded in the Spring 2016 at the time the data were provided to researchers, so completion numbers do not accurately reflect student retention and completion outcomes. Additionally, students may enroll in a degree program that consists of a certificate program, and, because of the way data were presented, researchers could not determine if a student receiving a degree also received a certificate as part of their program. The date of enrollment was not included in the data set making it difficult to ascertain how students progressed through their programs.

Researchers analyzed student outcomes by examining SUNY TEAM students' attainment of degrees and certificates, retention rates, and employment outcomes. These data were explored through quantitative analysis, calculating descriptive statistics for students overall, and by SUNY TEAM technical tracks. In addition, where possible, Hezel Associates researchers disaggregated student outcomes data by program, gender, and other demographic variables (e.g., veteran, Pell-grant, TAP, economic status). The following sections present findings pertaining to (1) SUNY TEAM technical track certification outcomes, (2) overall student outcomes across all programs, and (3) employment outcomes resulting from the students participating in these manufacturing programs.

SUNY TEAM Technical Tracks

Completion and retention rates for each technical track program are presented in Figure 2. ECC's Precision Machining program was pre-existing and, not surprisingly, had the highest number of students enrolled. OCC's Machining program was approved in 2014 and had the highest enrollment of the *new* programs. The remaining programs were approved very late in the grant period, thus low enrollment. Again, degree awards from Spring 2016 were not reported from all schools when data were aggregated. The completion numbers may be understated because of this. Also, percentages for Advanced Manufacturing, Automation Systems: Mechatronics, Industrial Technology: Manufacturing Technology, Mechatronics, and Plastics Manufacturing are based on very small sample sizes and therefore, may not be accurate reflections of true program retention. All seven programs are certificate programs, so those who completed the program were awarded a certificate. Of the seven programs, only Advanced manufacturing – Machining (OCC) and CNC Precision Machining (ECC) have program graduates.

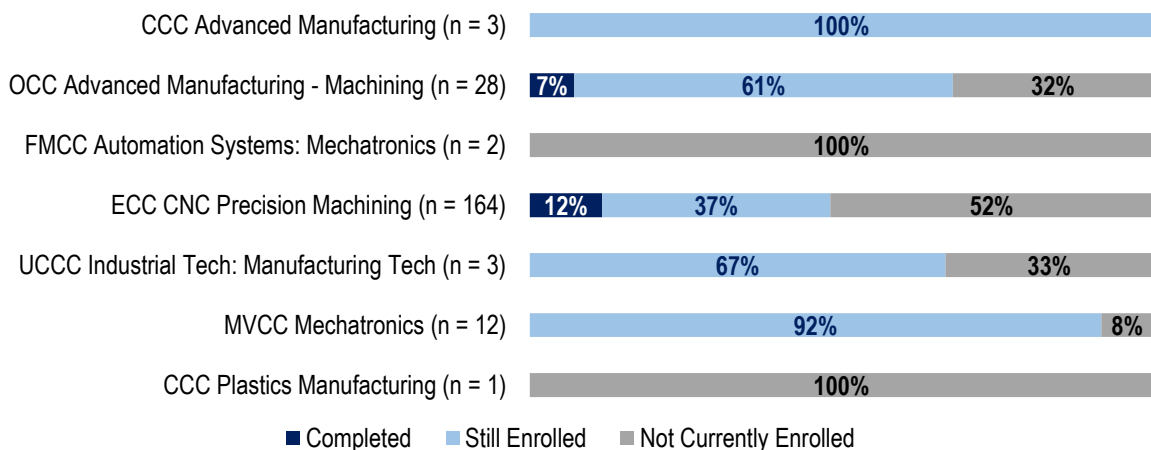


Figure 2. Retention by Technical Track Program

The new programs enrolled 213 students from Fall 2014 to Spring 2016. Genders of participants by program are presented in Figure 3. A high percentage of students enrolled in certificate programs were male, although 25% of students enrolled in MVCC's Mechatronics program were female. Other demographic findings include CNC Precision Machining having the most TAP and Pell grant recipients, and according to the data, was the only technical track program that included veterans. Participants in the new programs were mostly white and male. Automation Systems: Mechatronics had the youngest cohort, while Mechatronics attracted older participants. For summaries of respondents by age, gender, ethnicity, enrollment status, and more, please see Appendix E.

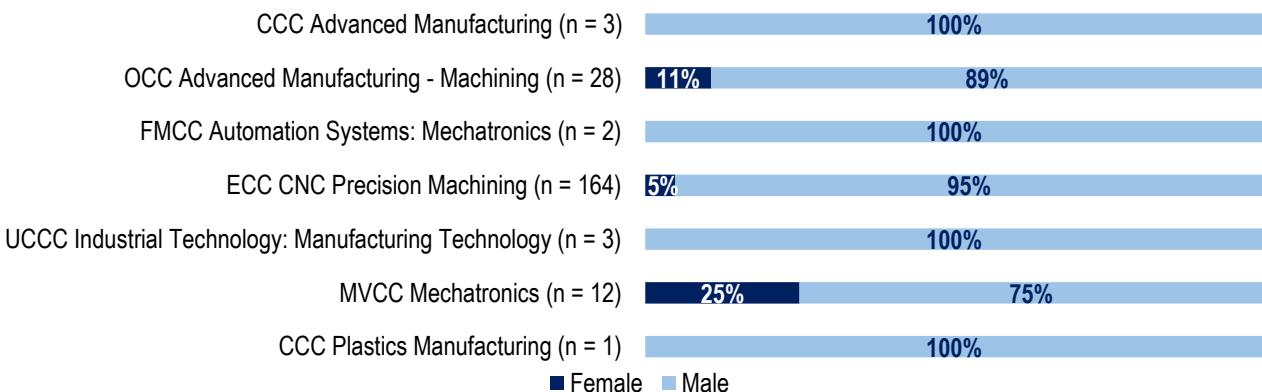


Figure 3. Gender by Technical Track Program

APR Student Outcomes

This section outlines the outcomes for participant students across 33 programs at nine of the schools represented in the APR. Specifically, this section looks at degrees awarded by college, program retention across key demographics, as well as how the degrees were awarded over semesters. Overall, students that participated in these programs were predominately male and slightly older than college age. Additional demographic information can be found in Appendix E. On average, participants were 28 years old and 92% of students were male.

Across schools and programs (n = 2,043) from Fall 2014 to Spring 2016, 13% of participants completed their program with an associate's degree or certificate, 42% of participants are still enrolled, and 45% of participants are not currently enrolled in the college (see Figure 4). Of those who completed, 28.9% (n = 79) obtained certificates and 71.1% (n = 194) obtained an associate's degree. Please note that this may not be an accurate representation of student retention due to the delays in reporting from some programs.

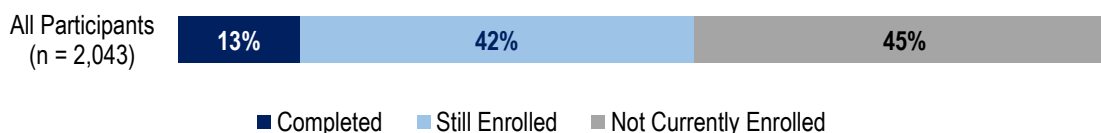


Figure 4. Overall Retention

Gender

From Fall 2014 to Spring 2016, males and females had similar completion and retention rates (see Figure 5). There was a slightly higher completion rate for men than women. Overall, a small percentage of students, whether they are male or female, completed a degree or certificate, and half are not currently enrolled. In Appendix E gender is broken by school.

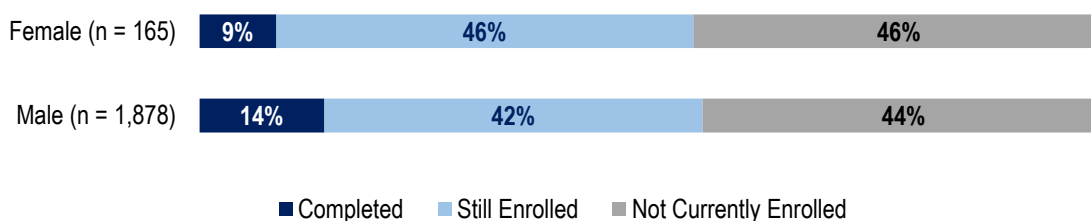


Figure 5. Retention by Gender

Degree Type

Table 5 summarizes the number of degrees awarded from Fall 2014 to Spring 2016, by college and degree type. Most degrees and certificates were awarded in Fall 2014 and Spring 2015. Overall, 276 degrees or certificates were awarded during that time. An Associate in Applied Science was the most common earned degree type by participants. More certificates and degrees were awarded in the spring as opposed to the fall, probably as a reflection of the school calendar. Data may not accurately reflect the number of degrees awarded in Fall 2015 and Spring 2016 because data from the nine all nine schools may not have been aggregated yet by SUNY's Office of Institutional Research and Data Analytics at the time this data were provided to researchers.

Table 5. Degrees Awarded by Type of Degree, College, and Semester

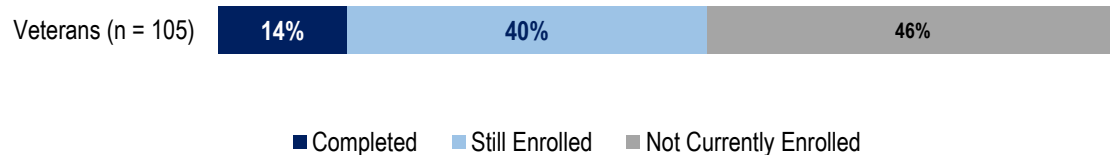
	Fall 2014		Spring 2015		Summer 2015		Fall 2015		Spring 2016	
	Cert	A.A.S.	Cert	A.A.S.	Cert	A.A.S.	Cert	A.A.S.	Cert	A.A.S.
Cayuga County	-	3	-	2	-	-	-	3	-	10
Erie	-	-	18	10	1	-	-	-	-	-
Fulton-Montgomery	-	3	-	14	-	3	-	-	-	-
Hudson Valley	-	1	-	10	-	-	-	-	-	-
Mohawk Valley ^a	5	5	15	17	2	2	-	-	-	-
Monroe	5	10	21	41	-	4	-	-	-	-
Onondaga	-	14	2	20	-	4	-	-	-	-
Schenectady County	1	3	-	9	-	-	-	3	-	7
Ulster County	-	-	-	3	-	-	-	-	-	5
Total	11	39	56	126	3	13	-	6	-	22

Note. A.A.S. = Associate in Applied Science; Cert = Certificate

^a The Manufacturing Production Technology course and the Welding Technology course at Mohawk Valley award an Associate of Occupation Studies (A.O.S.).

Veterans

Across all schools and programs from Fall 2014 to Spring 2016, 105 veterans were enrolled. Of those, 15 veterans completed with an associate's degree or certificate, 42 veterans are still enrolled, and 48 veterans are not currently enrolled in the college (see Figure 6). Of those who completed, five obtained certificates and ten obtained an associate's degree. On average, veterans were 34 years old and 97% were male.

**Figure 6. Retention of Veterans**

Pell-grant

Pell grants are awarded to undergraduate students primarily based on financial need and cost of attendance. Across schools and programs, 852 Pell grant recipients were enrolled. Data were reported by semester, therefore anyone who had received the Pell grant for at least one semester was counted as a Pell grant recipient. Of those enrolled, 112 Pell grant recipients completed with an associate's degree or certificate, 363 are still enrolled, and 377 are not currently enrolled in the college (see Figure 7). Of those who completed, 24% obtained certificates and 76% obtained an associate's degree. On average, Pell grant recipients were 28 years old and 92% were male.

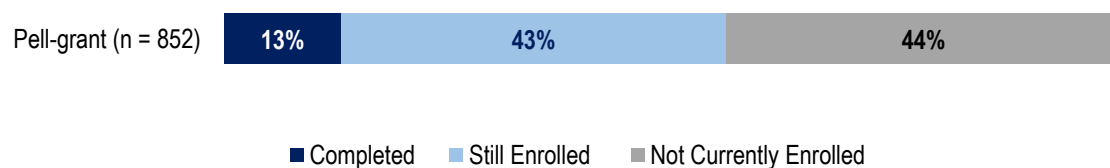


Figure 7. Retention of Pell Grant Recipients

Tuition Assistance Program (TAP)

The TAP grant is awarded to full-time, New York college students who are residents of New York state and are considered low-income. Across schools and programs, 692 TAP grant recipients were enrolled in TAACCCT programs. Data were reported by semester, therefore anyone who had received the TAP grant for at least one semester was counted as a TAP grant recipient. Of those enrolled, 100 TAP grant recipients completed with an associate's degree or certificate, 310 are still enrolled, and 282 are not currently enrolled in the college (see Figure 8). Of those who completed 30% obtained certificates and 70.0% obtained an associate's degree. On average, TAP grant recipients were 26 years old and 91% were male.

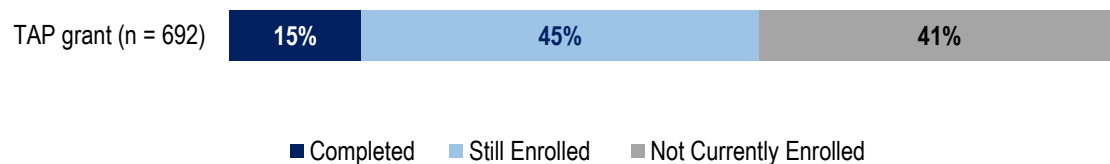


Figure 8. Retention of TAP Grant Recipients

Full-time Status

Across schools and programs, 1,254 students were registered as full-time, 561 as part-time, and 228 as a combination of both over the course of the grant. As seen in Figure 9, all three statuses have similar completion and retention rates.

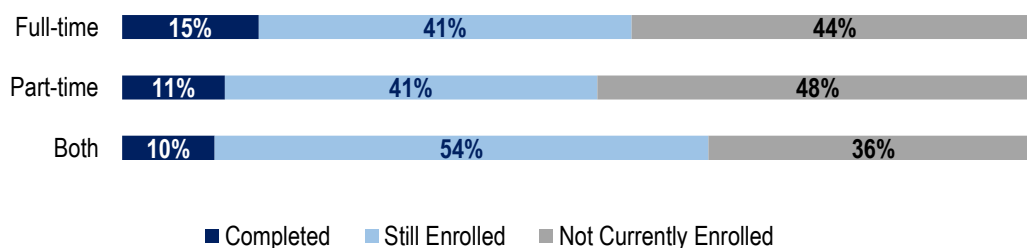


Figure 9. Retention by Full-time Status

First Generation College Student

Figure 10 shows retention rates comparing first generation college students to non-first generation college students. As can be seen in the figure, completion and retention rates are similar for both groups.

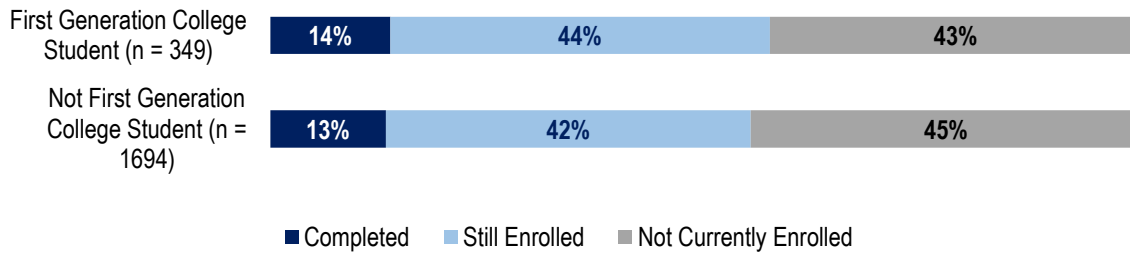


Figure 10. Retention by First Generation College Student

Economically Disadvantaged

Figure 11 shows retention rates comparing economically disadvantaged college students to not economically disadvantaged college students. As can be seen in the figure, completion and retention rates are similar for both groups.

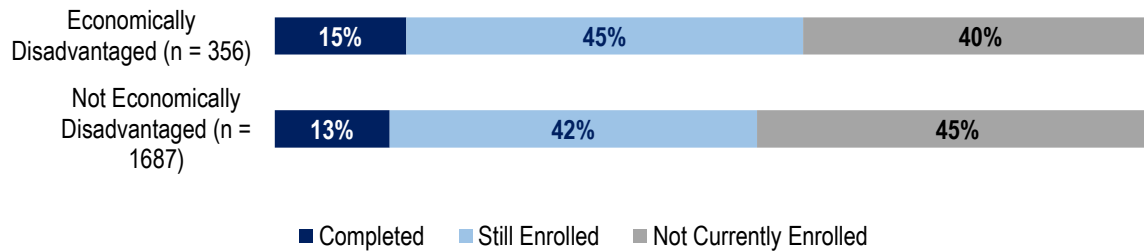


Figure 11. Retention by Economically Disadvantaged

By college

Participants were then examined by which college they attended and students' full-time status to explore if being a part-time student had any effect on completion or retention. Figure 12 shows that FMCC and MVCC have about 75% full-time students compared to Ulster and Monroe, who have the lowest number of full-time students. SCCC and Ulster have the highest number of part-time students.

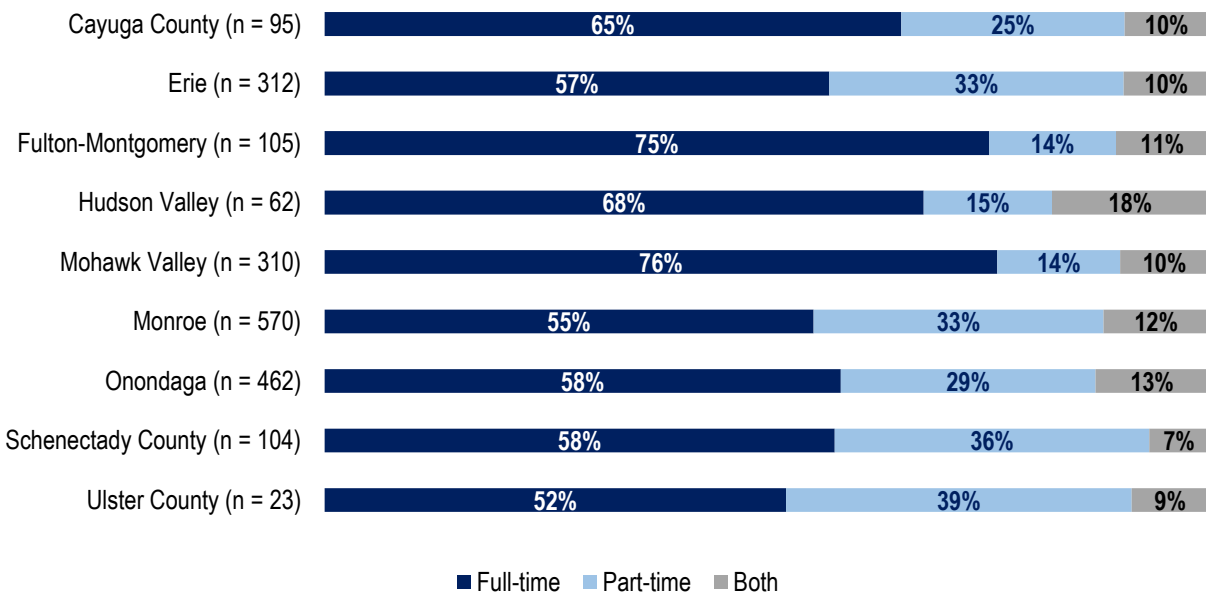


Figure 12. Full-time Status and College

Retention rates for each college are presented in Figure 13. All nine schools appear to have similar completion and retention rates. Schenectady and Ulster have the highest number of completers, but more than 50% of Schenectady students are not currently enrolled. Schenectady and Ulster also had the highest percentage of part-time students. Erie and Onondaga have the lowest percentage of students completing degrees or certificates and also a high number of part-time students.

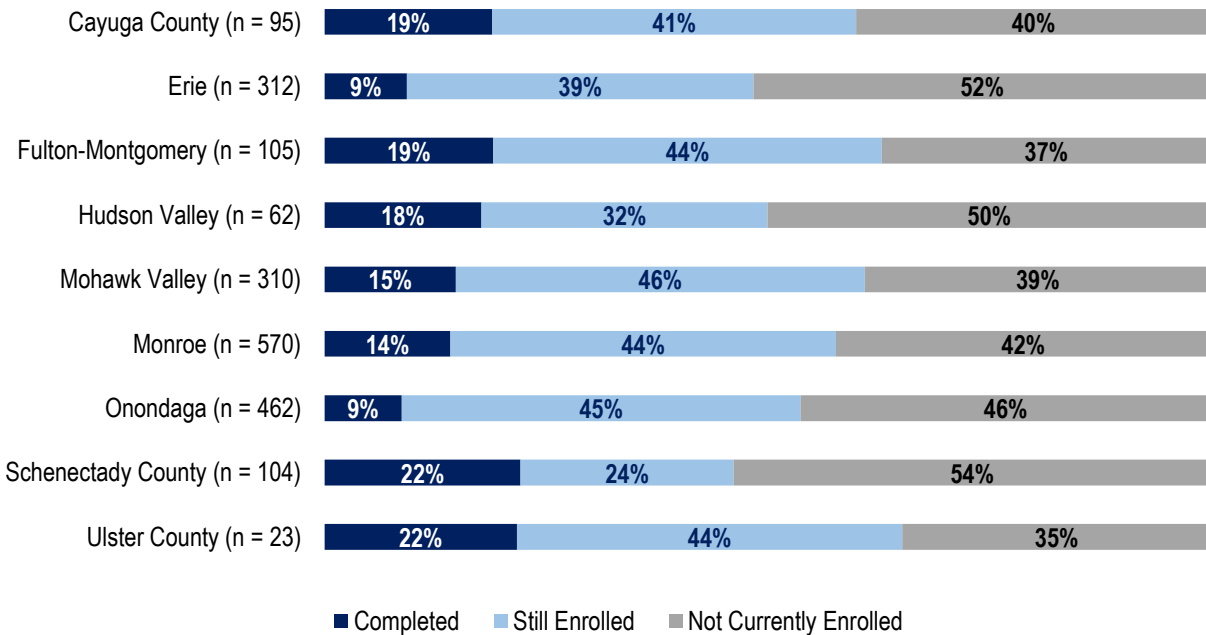


Figure 13. Retention of Participants by College

Employment Outcomes

Wage data were unavailable for SUNY TEAM participants, therefore, students who had recently completed a program were asked about wages in a questionnaire. The complete questionnaire is available in Appendix B. Consortium members and employers were also queried about wages for new hires during their interviews. The following section presents those findings.

Questionnaire data were gleaned from 11 SUNY TEAM colleges represented in the APR, and 57 students responded. Only students who had recently completed a program were administered the online questionnaire. Overall, students who are completing SUNY TEAM programs feel that they are prepared to enter into their field, and that SUNY TEAM colleges prepared them to be successful; however, company specific training is still needed according to employers. Most questionnaire respondents were satisfied with the services offered by SUNY TEAM programs, specifically hands-on training.

Consortium interview data indicate that students who complete a SUNY TEAM program are finding work quickly. Student questionnaire data corroborates that information as 67% percent of respondents are currently employed in their field of study (see Figure 14). Consortium members feel that students completing SUNY TEAM programs succeed in attaining quality jobs. One consortium member indicated that a student completing the optics program will have “about three to four job offers.” These data further support the success SUNY TEAM has had aligning their program with industry needs.

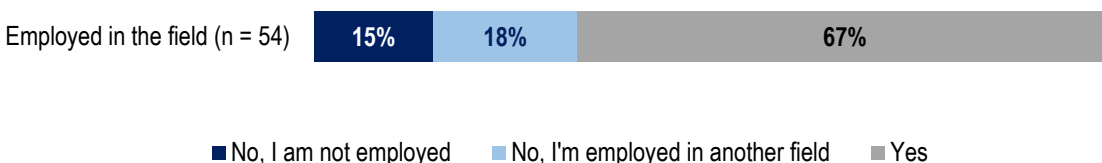


Figure 14. Employed in field

Figure 15 denotes the number of weeks it took students to find employment in their field. The data indicate that 33% of respondents found employment in their field within one week of program completion. Another 26% of students were employed within six weeks. Therefore, more than half (59%) of program completers are finding employment in their field in less than two months. The fact that students are finding employment so quickly speaks to the demand for advanced manufacturing labor. Consortium interviews reflected this finding as well. According to employer interviews, once hired, students should be making between \$10 and \$20 per hour for entry-level positions with the ability to be promoted rather quickly.

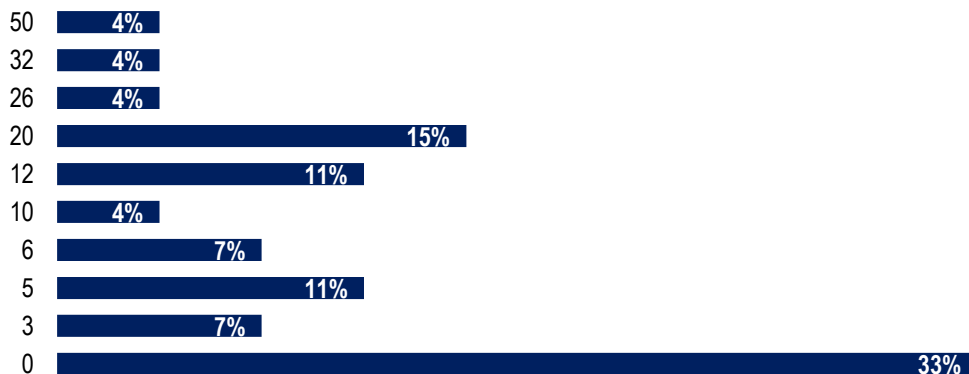


Figure 15. Number of Weeks Before Employment (n = 27)

Students completing SUNY TEAM programs are finding employment, but student questionnaire data show that students (74% of the new hires) believe they needed additional training when they started work (see Figure 16). However, employers feel that the new curriculum for technical tracks will reduce the amount of training needed for people hired from their programs.

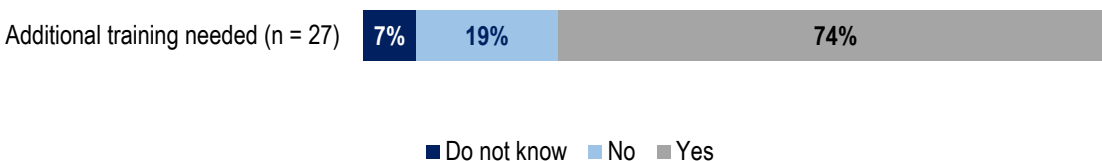


Figure 16. Additional Training Needed

Consortium members agreed that curriculum provides students with basic knowledge, while company specific training is still required. Nine of the questionnaire respondents have earned one of the following credentials: MSSC (1), OHSA (4), and Lean Six Sigma (4). As more new and revised curriculum is being implemented at SUNY TEAM colleges, the number of students receiving credentials should increase. Employers are confident that students hired from these programs can hit the ground running once hired. They believe that in the future they will be required to commit fewer resources to training costs if they can hire from these programs.

Respondents were asked if completing their program had a direct result on the listed employment outcomes; responses are shown in Figure 17. Most respondents had positive answers to statements about the impact of their program on their employment. Most respondents feel prepared to work in their field (89%) and have increased confidence in the workplace (77%). Seventy-five percent of respondents had found a job in their field when they took the survey.

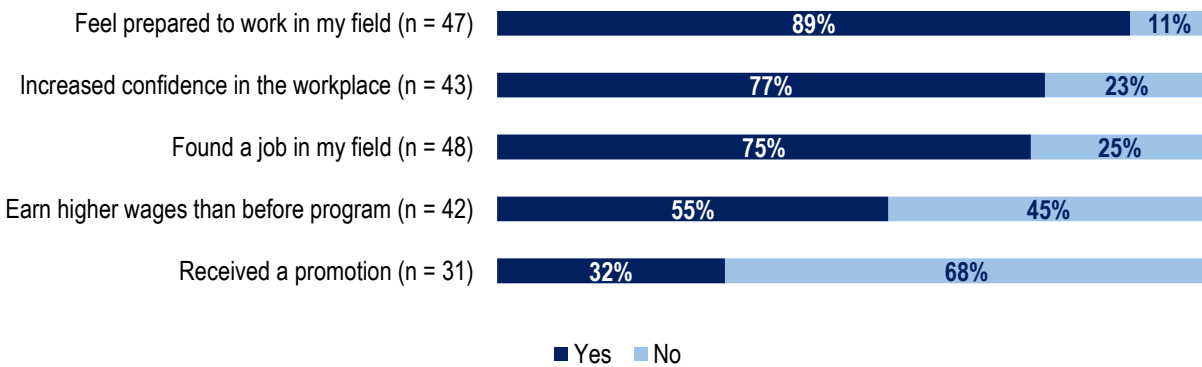


Figure 17. Perceived Program Completion Outcomes

Respondents were asked to rate their ability to perform tasks at work using a 7-point Likert scale ranging from *Strongly Agree* to *Strongly Disagree*. The percentage of respondents that selected *Strongly Agree* or *Agree* is displayed in Figure 18. Responses suggest that respondents feel prepared to perform a multitude of tasks at work, especially applying math skills, technical skills, and quality control knowledge. Respondents were less confident in their abilities to manage their time and lead groups of people. A total of 57 participants took the questionnaire, but for this question, participants could select *Does Not Apply*. Therefore, for some of the items, fewer than 53 responses were included in the findings since the *Does Not Apply* responses are not factored into the calculations here.

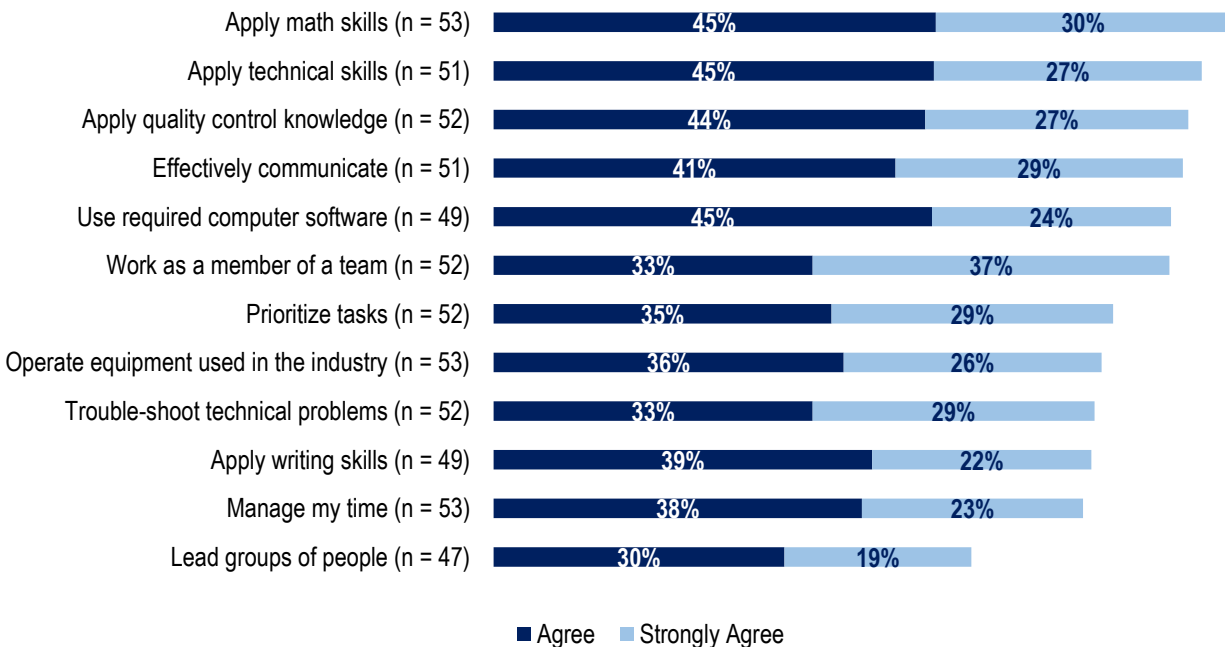


Figure 18. Perception of Ability to Perform Work Tasks

Respondents to the student questionnaire were asked whether the program provided them with one of the six outcomes listed in Figure 19. Respondents who selected “Yes” were then asked to

rate the degree of satisfaction that their expectations were met using a 7-point Likert scale. The percentage of respondents that selected *Strongly Agree* or *Agree* that their expectations were met is listed below. The program met most respondents' expectations, especially providing hands-on training and improving math skills. Only 17 respondents expected an internship to be part of their program. Similar to satisfaction with internships opportunities (previously introduced Figure 1), the statement relating to internship participation received one of the lowest ratings of all activities and outcomes. In the future, colleges should explore why students are not as satisfied with internships compared to other program outcomes.

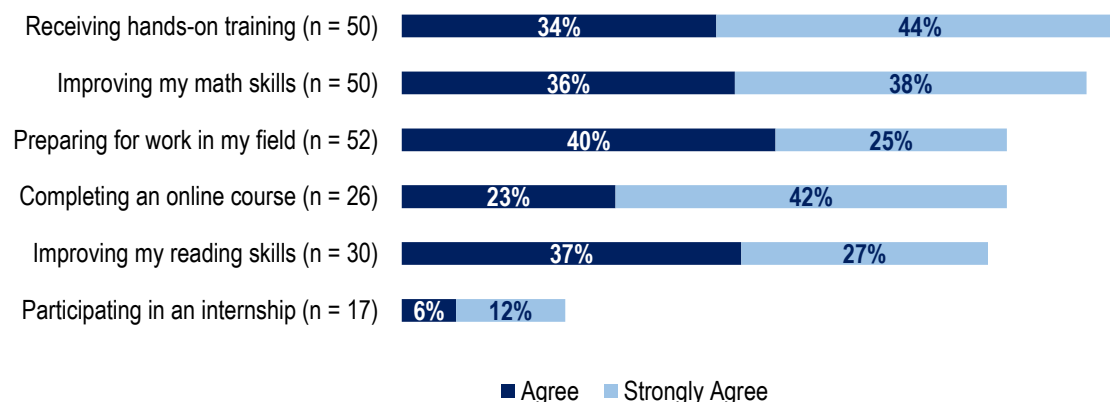


Figure 19. Satisfaction That Student Expectations Were Met

Impact on Consortium Colleges

Although the evaluation primarily impacts student outcomes, it is also important to consider the effects that SUNY TEAM has had on its member colleges. A substantial change for the colleges was the addition of new programs or the enhancement of existing programs. In some cases, the technical tracks were an expansion of a program or a repackaging of courses and content into a more formal curriculum. Others started from scratch and established a brand new program, particularly within Mechatronics. The additional capacity, created by investments in lab space, equipment, and materials increases the possibility for colleges to provide technical training to students in the future. Most staff indicated that the technical tracks will continue to be offered at their respective colleges and many schools are actively looking to expand their advanced manufacturing in the future, building on the momentum created by SUNY TEAM.

The consortium had an important impact on the member institutions because it fostered partnerships among community colleges that would have not otherwise occurred. The curriculum and PLA committees formed across colleges and created a network of New York advanced manufacturing that is stronger than what existed prior to the grant. In addition, most SUNY TEAM colleges have expanded their relationships with employers by establishing linkages with new companies, while strengthening their relationships with existing partners. Employer partners not only assisted with curriculum and program development, but helped design physical lab spaces, donated equipment, provided internships, taught courses, and provided facility tours. Some employers have even contacted program coordinators to recruit soon-to-be graduates. These partnerships are essential to the future of manufacturing in New York State and sustaining them is in the best interest of colleges, students, and employers.

CONCLUSIONS

SUNY TEAM met most of the expectations for the strategies and milestones included in the work plan. The delay in the internal curriculum development process and hiring delays contributed to the low enrollment numbers in the technical tracks created through the grant. However, the impact of grant funding will be felt for years to come as participating colleges build upon what was started by SUNY TEAM. While not all milestones were completed within the initially proposed timeframe, most were completed during the grant period.

In terms of specific findings from evaluation of the four-year grant project, Hezel Associates has concluded the following:

- **SUNY TEAM leadership performed well.** SUNY TEAM was an enormous undertaking, and MCC had never managed a grant of this size. The project director and operations coordinator from MCC handled budget and grant requirements effectively, while the statewide coordinator played a crucial role coordinating curriculum development activities across the state. They were responsive to the needs of the coordinators, who were complimentary of the role they played. The delays in curriculum development were out of the control of the project team, who did everything within their power to meet scheduled milestones and deliverables. The curriculum development delays and slow hiring process were not a result of the efforts of SUNY TEAM leadership.
- **Although development was delayed, the curriculum created through SUNY TEAM is of high quality.** Developing curriculum for educational pathways constituted much of SUNY TEAM activity. The core curriculum, six technical tracks, and developmental education curriculum went through a rigorous vetting process that included input from multiple partners. Partners included college faculty and staff, education consultants, industry experts, and local and regional employers. Curricula are embedded with certifications, and the consistency of content was ensured by providing templates to developers. The curricula are available on Creative Commons and can be adopted by other programs.
- **Employers are engaged and the need for qualified employees to fill positions still exists.** SUNY TEAM consortium members did an excellent job engaging employers and industry partners in the curriculum development and program design process. The curriculum for the six technical tracks aligns with industry standards and applies to multiple employers within specific regions. Employers are excited to see the results of the advanced manufacturing programs and expect larger, more qualified applicant pools, reduced training costs and increasing the number of qualified workers to keep up with growth and loss of workers due to retirement. Pre-existing relationships, like the Council of Industry in Hudson Valley, serve as catalysts for employer involvement. Partner colleges should continue to nurture those relationships as a potential resource to ensure the sustainability of the new and updated advanced manufacturing programs beyond the grant period. The ability to sustain and expand SUNY TEAM programs will require employer involvement.

- **Developing statewide PLA standards was a difficult task due to the scope but progress was made during the grant.** Significant progress was made toward developing a statewide PLA process, but the complexity of unifying the statewide PLA system across SUNY community colleges was a barrier. Empire State College did well to help SUNY meet most of the PLA milestones for the grant. SUNY colleges should continue to upgrade their statewide PLA processes moving forward and continue the work at SUNY System Administration to update existing PLA policies as recommended by the PLA Report from Empire State College and the PLA Advisory Board to SUNY System.
- **ToolingU is an effective online resource to support student learning.** Colleges that used ToolingU reported that it provided students with additional support for their hands-on training. Although the online manufacturing courses cannot replace experience from using the actual machines, students and faculty found that it was utilized to help students practice outside of class. Some instructors integrated it into their coursework, and Erie hopes to expand the use of ToolingU in the future.
- **Facility upgrades will be felt by colleges and students for years.** The added capacity of new equipment and technology has laid a foundation for advanced manufacturing programs in New York. Many interviewees believe the new technology is one of the most substantial outcomes for partner colleges, allowing students or incumbent workers to receive hands-on training with the actual equipment used by employers. Consortium members purchased equipment that aligned with the programs they are developing, utilizing input from employers and industry partners. In some cases, employers assisted by installing equipment or designing lab space. Some colleges' facilities have been described as "state of the art."
- **The impact of SUNY TEAM on student outcomes is difficult to quantify.** Researchers could not accurately measure the impact of SUNY TEAM through outcome data. Many of the programs counted in the APR were pre-existing and improvements to those programs via TAACCCT funding varied, making it difficult to identify a specific intervention funded by TAACCCT. The delayed implementation of the educational pathways, coupled with low initial enrollment numbers made it difficult to make an assessment of the program model.

RECOMMENDATIONS

Although the funding for the SUNY TEAM project has ended and the formal consortium structure will no longer exist, Hezel Associates offers the following recommendations for individuals interested in maintaining aspects of the collaboration or for further research.

- **Colleges should continue to adapt curriculum elements that suit their labor market, workforce, and student needs.** Each SUNY TEAM college has unique characteristics, considering they are in different regions of the state. Local and regional labor markets, student populations, institutional culture, college protocols and resources, among other things, differ. While educational pathways are intended to be expanded, some colleges made slight changes to accommodate specific needs. For example, the original semi-conductor/nanotechnology pathway morphed into a mechatronics curriculum that colleges in the Capital District and Mohawk Valley integrated into their programs to fit what local employers needed. These sorts of adjustments should be considered to allow the program to fit into the institutional culture and structure, as well as to ensure it works for an institution's specific student population. The intent of the curriculum is not to be rigid, but should draw on relevant elements to develop the most effective program for student success. Moving forward, the SUNY TEAM colleges who are seeking to adapt the curriculum created through the grant should utilize aspects that work best for their local students and employers. MCC and Erie have utilized this process to develop mechatronics programs.
- **Maintain a semblance of unity in regards to advanced manufacturing.** SUNY TEAM linked together community colleges from across the state to grow advanced manufacturing in a way that had not been done before. There was truly a "team" aspect to the endeavor. Together, SUNY's community colleges built a network of individuals who care about getting students credentialed and employed. Some are concerned that as the grant ends, so will the statewide momentum. This could be addressed by maintaining a statewide manufacturing coordinator, as some consortium members suggested, or holding bi-annual or annual summits. If not maintained at the state-level, colleges situated within the same region could apply for grants as partners. It is important to the sustainability of new programs that the original purpose of the grant is not lost because the grant ended.
- **Market new and revised programs.** Substantial resources were invested in the advanced manufacturing programs, but it will all be for naught if potential students are not aware of the new opportunities. SUNY TEAM made statewide marketing efforts such as the Manufacturing Minds website (www.manufacturingminds.com), but partner colleges should continue to market their programs individually or collectively to bring in new students. The need for skilled employees continues to exist for employers, but in order to sustain the programs, enrollment must be maintained. Consortium members and employers expressed concerns about marketing new and revised programs in the future.
- **Make finding qualified instructors and student funding sources a priority.** Some consortium members were concerned with the lack of available instructors to teach courses on equipment used by industry. Many hire adjunct faculty, who work full-time with local companies. In order to expand manufacturing programs to meet the growing

need for qualified employees, experienced instructors are needed. An obstacle for the continuation of the SUNY TEAM work is the lack of resources. Pursuit of additional grant funding could allow schools who did not adapt curriculum during the grant period to continue to develop their advanced manufacturing capabilities. Potential funders include the National Science Foundation, particularly the Advanced Technology Education program; the Bill & Melinda Gates Foundation; as well as several STEM-specific opportunities listed on the U.S. Department of Education website (<http://www2.ed.gov/about/offices/list/ovae/pi/cclo/stem.html>).

- **Measure the impact of the pathways.** Researchers could not measure the impact of the new pathways at consortium colleges using wage data for reasons listed in the Limitations section below, but other data collection methods show that a strong foundation has been created using grant funds. Further research of the SUNY TEAM educational pathways is needed to determine their effectiveness at achieving positive student outcomes.

LIMITATIONS

Due to unavailable data that has not yet been reported to the SUNY Office of Institutional Research or provided by NYDOL, the evaluation was unable to address some of the outcomes questions. Longitudinal data were not provided; therefore, Hezel Associates was unable to address research question 3.2, as to whether there was an *increase* in certificates and diplomas. Hezel Associates was only able to report frequency data. In addition, no data were provided on withdrawal or retention, only completion. Therefore, withdrawal was assumed if a student had not completed and was not registered in the next semester; however, this assumption could be incorrect. Because starting dates were not provided for many programs, researchers could not be sure whether a student was entering the course in Fall 2014 or continuing from the previous semester. Additionally, because of the lag in reporting degrees awarded, many schools did not provide their data for Fall 2015 and Spring 2016 because the data was not yet due to be reported to SUNY Office of Institutional Research.

Hezel Associates was also unable to accurately address research questions 3.3 and 3.4, as no employment or wage data were available because wage records could not be shared with evaluators by NYDOL due to privacy laws. Without wage data, researchers were unable to identify factors that contribute to employment outcomes and whether the program improved employment outcomes. Additionally, analysis with a comparison group was not possible, as most institutions do not collect social security numbers or student ID numbers of non-TAACCT participants and non-credit students, which is a necessary identifier for state wage records and student data. Further, the MOU between SUNY and NYSDOL prohibits releasing unit record data to third parties, so even if SUNY had wage data, they cannot release it to an outside agency/firm/contractor. The data can only be worked on by SUNY employees at a SUNY facility using SUNY computers.

Lastly, SUNY TEAM employed a data analyst who worked in the SUNY Office of Institutional Research in Albany, where the data are aggregated. The data analyst was hired in late 2014 but resigned early in 2015 and the position was never filled.

REFERENCES

Dey, I. (1993). *Qualitative data analysis: A user-friendly guide for social scientists*. London, UK: Routledge.

APPENDIX A: RESEARCH QUESTIONS

1. Implementation
 - 1.1. How did the governance and organizational structure affect the overall design and implementation of the SUNY TEAM educational pathways?
 - 1.1.1. What was the program administrative structure?
 - 1.2. To what extent did the program implement curriculum development methods that were both innovative and effective?
 - 1.2.1. How was the particular curriculum selected, used, or created?
 - 1.2.2. How were programs and program design improved or expanded using grant funds?
 - 1.2.3. What delivery methods were offered?
 - 1.2.4. Did grantees conduct an in-depth assessment of participant's abilities, skills, and interests to select participants into the grant program?
 - 1.2.4.1. What assessment tools were used?
 - 1.2.4.2. Who conducted the assessment?
 - 1.2.4.3. How were assessment results used?
 - 1.2.4.4. Were assessment results useful in determining the appropriate program and course sequence for participants?
 - 1.3. To what extent did the program deliver the curriculum with quality and as defined by the timeline?
2. Program Design
 - 2.1. To what extent does the program curriculum address the specific industry needs?
 - 2.2. To what degree do the educational pathways programs prepare TAA-eligible workers and others for high-wage, high-skill employment or re-employment in growth industry sectors?
 - 2.3. 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 (a) program design, (b) curriculum development, (c) recruitment, (d) training, (e) placement, (f) program management, (g) leveraging of resources, and (h) commitment to program sustainability?
 - 2.3.1. What factors contributed to partners' involvement or lack of involvement in the program?
 - 2.3.2. Which contributions from partners were most critical to the success of the grant program?
 - 2.3.3. Which contributions from partners had less of an impact?
3. Outcomes
 - 3.1. To what extent did the program increase the attainment of certifications, certificates, diplomas, and other industry recognized credentials?
 - 3.2. To what degree did the program curriculum improve learning outcomes and retention rates for TAA-eligible workers and other adults?
 - 3.3. To what extent did the program improve employment outcomes?
 - 3.4. What are the factors that contribute to education and employment outcomes?
 - 3.4.1. Factors the TEAM educational pathways project immediately trying to impact?
 - 3.4.2. Factors the program not be expected to impact?
 - 3.5. How does each of those factors bear on those outcomes individually and in concert with others?

APPENDIX B: YEAR 4 INSTRUMENTS

Document Review Framework

Strategy 1: Develop and promote career pathways in advanced manufacturing with clear entry and exit points to meet trainees' education and employment needs.						
Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on start-up governance structures; detailed and high level analysis of requirements and solution design. 1. Start-up administrative tasks: Hire staff; Contract process; Communications; Establish Steering Committee. 2. Research educational and skill requirements for each occupational area. 3. Faculty teams develop uniform educational pathways in advanced manufacturing, assuring academic rigor and transferability. 4. Share final, approved educational pathways document across TEAM members and partners. 5. Strengthen articulation agreements throughout SUNY system modifying current policies to facilitate portability of credits.	Colleges	On-going		All staff hired, contracts approved, and monthly Steering Committee meetings held.		
	SUNY Admin	On-going		Employer outreach and occupational data collected and used to design Educational Pathways; design approved by SUNY, colleges, MACNY, MANY, employer partners.		
	Employers					
	WIBs	5/1/14		Educational Pathways rolled out to colleges and WIBs market to potential students.		

Strategy 2: Build and offer uniform core & specialty curricula based on the DOL competency model incorporating NAM endorsed Advanced Manufacturing.						
Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on curriculum development for diverse adult learners to effectively address learning outcomes for job success. 1. Define skill needs with MACNY, MANY, industry partners; Build accelerated curricular framework, focus on self-paced learning to promote heightened sense of commitment of worker; Write curricular content/supporting instructional materials using DOL knowledge, ideas, and experiences. 2. Incorporate stackable and latticed credentials offered through: NCRC, MSSC, NIMS, AWS, and SME. 3. Create one year for-credit/non-credit specialty technical certificates; Develop specialty courses to include: Six Sigma, OSHA.	Colleges	9/1/14		Curricula developed and consistent with partner community college expertise and industry need; revised core courses piloted by primary community college partners.		
	SUNY Admin Employers	9/1/14		Embedded NAM certifications to include the MSSC, NIMS, AWS, SME, and Lean Six Sigma in uniform stackable core credentials within existing curricula.		

Strategy 3: Validate new and existing curriculum with industry and industry associations at the local, state, and national levels.						
Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on developing a validating mechanism for industry partners to engage with curriculum designers. 1. Establish curriculum committees comprised of educators, employers, and industry associations. 2. Create validating mechanism framework (process) to allow industry partners and faculty identify areas of contradiction/agreement. 3. Provide joint faculty/employer training related to industry certification and skills standards to fully understand industry requirements.	Colleges	1/15/14		Process created to identify areas of agreement/contradiction and refine curriculum to the satisfaction of MACNY, MANY industry associations.		
	SUNY Admin Employers	1/15/14		Common understanding developed of the psychosocial factors of adult learners based on competency models related to readiness to learn, motivation, and other attributes.		

Strategy 4: Build and offer fast track developmental education curricula in support of Advanced Manufacturing programming.						
Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on design and implementation of compressed, accelerated developmental programming. 1. Research and select model programs in fast-track developmental education such as the I-BEST, ALP, Breaking Through, and the National Repository of Online Course; include integrated academic tutoring and student support. 2. Pilot program models at selected partner community colleges.	Colleges	5/1/14		Courses selected/customized using diverse instructional techniques focused on self-paced, individualized instruction; Course selection to enhance workplace literacy skills to move worker quickly through remedial instruction and complete certificate.		
	SUNY Admin	On-going		Members of Collaborative work in partnership to share practices relating to developmental education.		

Strategy 5: Offer core, specialty, and developmental education courses via on-line and other alternative delivery formats.

Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on IT infrastructure; selection and customization of courses; establishing a social media forum. 1. Improve IT infrastructure to support growth in online learning by increasing network bandwidth and availability. 2. Coordinate delivery of core curricula with partner community colleges; Implement centralized college calendar across SUNY. 3. Identify selected core and specialty courses for alternative delivery, including online delivery to facilitate self-paced learning. 4. Campuses will work with the SUNY Learning Network and SME ToolingU.com to offer full courses on-line; Develop competency-based assessments.	Colleges	6/1/14		IT infrastructure improvements purchased and in place to support major growth in online delivery of courses; Course selection customization completed and rollout scheduled.		
		9/1/14		Manufacturing Worker Learning Community established and integrates advanced manufacturing courses with basic skills courses.		

Strategy 6: Build and offer uniform statewide system for awarding academic credit through prior learning assessment.

Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on working with ETS to identify PLA assessments; schedule and offer PLA assessments to workers. 1. Work with Empire State College to create uniform policies/practices for identifying credible work-based experiences. 2. Train faculty/staff on each campus to serve as evaluators for participants requesting academic credits based on previous work and life experiences; Define "college-level learning" and how to assess it among TAA-eligible workers and veterans.	Colleges SUNY Admin	5/1/14		Creation of uniform statewide policies and practices		
		9/1/14		Implementation of a state-wide system for evaluating PLA		
		9/1/14		Prior learning and competency-based assessments chosen to assess allowable skills		
		9/1/14		Professional development about PLA developed		

Strategy 7: Provide centralized student services through campus-based TEAM Centers working in partnership with the public workforce system.						
Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on creating SUNY wide Centers for customized on-demand support, guidance, and resources for workers. 1. Each partner college establishes a TEAM Center – virtually or physically – with dedicated program coordinator or case manager. 2. Coordinator/case manager conducts outreach to college support services, i.e. academic advisors, financial aid and career counselors, industry and peer coaches/mentors, local public workforce systems, job placement services, and others to provide targeted case management services to enable workers/participants to accomplish specific education objectives. 3. Learner Web, web-based learner support system, implemented at campuses to assist with case management of students.	Colleges	6/1/14		Centers established and connect employment, education, training, and community support		
	WIBs	6/1/14		Centers integrate support services from local educational programs, social service organizations, one-stop offices, colleges, and community based organizations		

Strategy 8: Build and implement a coordinated statewide approach to outreach, recruitment, and Earn and Learn models for the Advanced Manufacturing industry.

Activities	Implementer(s)	Projected Date	Date Accomplished	Milestones	Progress	Notes
Focus on marketing/recruitment efforts; Earn and Learn partnerships; Increasing worker/employer connections. 1. MACNY and MANY collaborate with SUNY Collaborative to build and rollout an outreach and recruitment plan using the existing advances manufacturing infrastructure across NYS; Coordinate media efforts including website, webinars, and print materials. 2. Conduct the NAM "Dream It, Do It" awareness campaign Conduct career exploration camps, student-in-the-workplace and teacher-in-the-work place programs for targeted stakeholder groups including workers and college faculty.	Colleges	9/1/14		Job fairs conducted and employer networking sessions to increase connections between employers, participants, and community colleges, WIB/One-stops.		
	SUNY Admin Employers	1/31/16		Innovative partnerships established between employers and colleges/universities to help workers complete their education while working in high need fields.		

Consortium In-Depth Interview

SUNY TEAM TAACCCT Grant Evaluation–Year 4 Consortium Interview Protocol

Format	<p>Qualitative research to collect opinions, and will span a broad range of issues regarding:</p> <ul style="list-style-type: none">• Program design• Curriculum development• Program organizational structure <p>Semi-structured interview protocol outlines pre-determined questions, and allows the interview to probe and pursue unplanned tangents as conversations warrant.</p> <p>Respondents will be recruited via email.</p>
Targets	<p>Respondents will be consortium members involved in program development and implementation.</p>
Evaluation Questions	<p>Interview questions will address the following research questions:</p> <ol style="list-style-type: none">1. Implementation Questions 1.1, 1.2, 1.32. Program Design Questions 2.1, 2.2
Timeline	<p>Interviews will take approximately 30-45 minutes and will be conducted by telephone in May and June of 2015.</p>

Initial Recruiting Email

The SUNY TEAM Consortium has partnered with Hezel Associates, a research firm in Syracuse, NY, to conduct the independent evaluation of the USDOL TAACCCT Round 2 grant.

As a part of our responsibilities, we will be conducting phone interviews with representatives from the SUNY TEAM programs. You have been selected as a potential participant due to your involvement in SUNY TEAM. The purpose of our evaluation is to provide feedback to the SUNY TEAM Project Director and to help improve grant-funded activities.

Telephone interviews will require 30-45 minutes. We are scheduling interviews between August 1 and August 12. Please respond to this email with times and dates you are available to participate in an interview during this timeframe. We will send you a return email confirming your scheduled interview.

This evaluation is being coordinated with Cortney Harris, SUNY TEAM Project Director and Paula Hayes, SUNY TEAM Statewide Coordinator. If you have any questions about the evaluation or interviews, Paula can be reached by email at paula.hayes@suny.edu. You are also welcome to contact me if you need more specific information regarding details of the evaluation study.

Thank you for your support.
Sincerely,
[SIGNATURE OF SENDER]

Pre-Interview Confirmation (via email), with Informed Consent Attachment

Thank you for agreeing to participate in the SUNY TEAM grant evaluation process.

As part of the SUNY TEAM project evaluation, Hezel Associates will be interviewing SUNY TEAM consortium members to explore the grant's program components and outcomes.

Your interview has been scheduled for:
[INSERT DATE / TIME]

We will call you at [INSERT PHONE #]. We expect the interview will last 30 to 45 minutes.

Your individual responses will be kept confidential and aggregated for the report. No personally identifying information will be reported, and we will make every effort to protect your identity when we present our findings. Please review the Informed Consent document attached to this email prior to the interview.

If you have any questions about the evaluation or your participation feel free to contact me, Cortney Harris, or you may email Solutions IRB (our external review board charged with ensuring we treat evaluation study participants ethically) at participants@solutionsirb.com.

Thank you for your participation,
[SIGNATURE OF SENDER]

Interview Instructions

ITEMS IN ITALICS SHOULD NOT BE READ TO INTERVIEWEE

Phone Interview Introduction

Hello, this is _____ from Hezel Associates. I'm calling about the interview we have scheduled to discuss your involvement with the SUNY TEAM project.

Is now still a convenient time to talk?

As a reminder, your responses will be kept confidential and aggregated for the report. No personally identifying information will be reported, and we will make every effort to protect your identity when we present our findings. You can stop the interview at any time and skip any questions you are not comfortable answering. You can also choose to withdraw your responses.

Have you read the informed consent document that was emailed to you?

IF NOT, GO OVER THE MAJOR SECTIONS WITH THEM, ESPECIALLY BENEFITS AND RISKS.

Do you have any questions about the consent form or the study?

Do you agree to participate in the interview?

I would like to record our interview to support my note-taking, and the recording will not be used for any other purpose. May I have your permission to record our conversation?

IF PARTICIPANT DECLINES RECORDING, RESEARCHER WILL TAKE NOTES.

Questions

- 1) To start, please describe your role in SUNY TEAM grant activities. *(For interviewer: SUNY TEAM = Training and Education in Advanced Manufacturing, funded by USDOL TAACCCT)*
 - a) When did you join the project?^{1.1}
 - 2) How would you assess the leadership of SUNY TEAM, in terms of communication, organization, and support over the course of the grant?^{1.1}
 - 3) Please describe any collaboration your school has had with TEAM Colleges during grant activities?^{1.1}
(Probe curriculum development group, program design, sharing information)
 - a) Has the collaboration been effective?^{1.1}
 - 4) Have you had any interactions with employers over the course of the grant? Other SUNY TEAM partners?^{2.3}
(Probe: employers, ToolingU, WIBs)
 - a) What specific contributions have those partners made to *[technical track(s)]*?
 - 5) What changes have resulted from the SUNY TEAM funding at your college?^{1.2}
(Probe: equipment, new/updated curriculum, student supports, staffing)
 - 6) What impact will those changes have on your manufacturing programs at your school after the grant?^{1.2}
(Probe: existing programs, new programs)
 - 7) Did TAACCCT provide any support in terms of recruiting students for advanced manufacturing programs at your school?^{1.2, 2.3}
(Probe: TAA-eligible participants, marketing strategy, PLA process)
 - 8) What support services did you offer participants at your *[college]*?^{2.2}
(Probe: why or why not, description of services)
 - a) Are the support services created from SUNY TEAM resources?
 - 9) What is the outlook for students effected by TAACCCT-funding finding relevant employment?^{2.1}
 - a) Why do you say that?
 - 10) Do you expect the SUNY TEAM activities (partnerships, student supports, employer involvement) to continue after the grant is over?
(Probe: plans for sustainability, why or why not)
- Thank you, that's it for my questions.
- 11) Is there anything else you'd like to say about the *[technical track]* or the SUNY TEAM project in general?

Employer Interview Protocol

SUNY TEAM Employer & Partner In-Depth Interview Protocol

Program	Advanced Manufacturing Plastics; Welding; Optics; Photovoltaic; Machining; Semi-conductor/Nano
Format	<p>Qualitative research to collect opinions, and will span a broad range of issues regarding:</p> <ul style="list-style-type: none">• Organization demographics• Curricular development• Outreach/marketing• Continuous improvement process dimensions <p>Semi-structured interview protocol outlines pre-determined questions, and allows the interview to probe and pursue unplanned tangents as conversations warrant.</p> <p>Respondents will be recruited via email.</p>
Targets	Respondents will be individuals who have participated in the curriculum development process in one of the six technical tracks.
Timeline	Interviews will take approximately 30-45 minutes and will be conducted in December and January of 2015-16.

1. Recruitment Email

From:

Subject: SUNY TEAM Employer Interview Request

Monroe Community College, on behalf of SUNY Training and Education in Advanced Manufacturing (SUNY TEAM), has selected Hezel Associates, a research firm in Syracuse, NY, to conduct an evaluation of the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant, funded by the Department of Labor.

As a part of our responsibilities, we will be conducting phone interviews with local employers who have participated in, or informed curriculum development for a community college in your region. The telephone interview will require approximately 45 minutes of your time, and will be conducted between Dec. 7 and Dec. 22. We have attached an assent form that provides more information about our study.

If you are interested in participating, please respond by with three dates and times that you are available, and a phone number to reach you. We will make every effort to accommodate one of those times.

The Hezel Associates Project Leader is Andrew Hayman. If you have any questions for him, he can be reached by email at andrew@hezel.com.

Thank you in advance for your participation.

Best,

[Your Name]

2. Interview Time Confirmation

From:

Subject: Your SUNY TEAM Interview Time

Thank you for responding to our request for an interview for the SUNY TEAM program evaluation. Your interview is scheduled for:

[DATE/TIME]

We will call you at [PHONE NUMBER].

Introduction

Hello, this is _____ from Hezel Associates, I'm calling to conduct your interview. Is now still a convenient time to talk?

As a reminder, your responses will be kept confidential and aggregated for the report. No personally identifying information will be reported, and we will make every effort to protect your identity when we present our findings. You can stop the interview at any time and skip any questions you are not comfortable answering. You can also choose to withdraw your responses.

Do you have any questions concerning the consent form or the study?

Do you agree to participate in the interview?

May I have your permission to record our conversation? The recording is strictly used to support my note-taking, and will not be used for any other purpose.

IF PARTICIPANT DECLINES RECORDING, RESEARCHER WILL ONLY TAKE NOTES.

Questions

1. To begin, could you tell me about your position and how it relates to the Advanced Manufacturing program at [College Name]? (*Probe: where they work, what is their relationship with the college*)

Curriculum Development

Next, I have a few questions about your involvement in curriculum development and program design...

2. Are there specific contributions you, or your organization have made to the project thus far? (*Probe: curriculum development, equipment, placement, recruitment*)
3. What is the biggest contributions that all employers have made to [Program Name] so far? (*Probe: skill set, career readiness, qualifications, work performance*)

Experiences with Participants/Graduates

Next, I have a few questions about your interactions with program participants or graduates

4. What are some of your priorities in your hiring decisions (*Probe: experience, school, degree, soft skills*)
5. What is your opinion of the SUNY TEAM students from [College Name]? (*Probe: skill set, career readiness, qualifications, work performance*)
6. How do the skills and content taught in the [Program Name] program align with the skills and knowledge you are looking for in a new hire?
7. What is your opinion on career preparation of students in the [College Name] [Program Name] program?
8. What are some improvements that could be made to the program? (*Probe: skills taught, areas in need of attention*)
9. Any other thoughts you would like to add?

Student Questionnaire

Email Invitation

Hello,

Congratulations on recently completing your degree or certificate at [Community College]. The program you completed receives funding from the United States Department of Labor under a Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant. The SUNY Training and Education in Advanced Manufacturing (TEAM) program is one of many TAACCCT-funded programs aiming to prepare students for high-wage, high-skill employment. Hezel Associates is working with SUNY System Administration and Monroe Community College to provide an evaluation of the SUNY TEAM program. As an individual who enrolled in a SUNY TEAM program, we are hoping to get your feedback about your experience with your program and your current employment.

Your feedback will be used to help measure the success and improve SUNY TEAM programs. Your individual responses are confidential and will be reported only as part of group feedback. This survey will take approximately 15-20 minutes. There is no risk of embarrassment or harm, as participants' identities will be kept confidential. Please complete the survey online by [date]. By participating, you can be entered in a drawing to win one of five \$50 Amazon.com e-giftcards. Your decision whether or not to participate will not affect your current or future relations with the SUNY TEAM. If you decide to participate, you are free to withdraw at any time from this study. This questionnaire has been approved by the [Community College] institutional research office

If you have any questions about this survey, please contact me by email (Andrew@hezel.com) or phone (315.422.3512).

Please click here to take the survey. **[survey link]**

Thank you,

Questionnaire Informed Consent

Hezel Associates, a research and evaluation company located in Syracuse, is assisting Monroe Community College with evaluation activities for the Training and Education in Advanced Manufacturing (TEAM) grant evaluation funded by the United States Department of Labor. We are asking students who have completed a TEAM program to participate in our data collection activities. Please know that participation in this evaluation is voluntary. All reports will present outcomes in aggregate form and will not include your name. If you choose to participate in this research, you may stop participating at any time.

Why are we conducting this study?

The funder for this project, the U.S. Department of Labor, requires data reporting on an annual basis. The evaluation will also help the SUNY TEAM principal investigators and coordinators to manage and improve project delivery as needed.

Research Benefits

Your participation in the evaluation will help the SUNY TEAM staff members to monitor project implementation. Your feedback will help to strengthen future delivery of this program, making TEAM stronger.

What are the study procedures?

You will be asked to complete this online questionnaire once. This questionnaire will take approximately 20 minutes to complete. You start the questionnaire by clicking on “yes” and then “continue” at the bottom of this message. If you complete the questionnaire and are willing to provide your name, you will be entered in a drawing for a \$50 gift card to amazon.com.

What other options are there?

While we appreciate your completing the entire instrument, you may skip questions. You may choose to refuse or discontinue participation altogether, without penalty or reprisal, however, a few items are required due to the nature of the questionnaire.

What are the risks of the study?

No more than minimal risk is involved in study participation. There are no known risks beyond those associated with daily life while you are providing data. The study questions and processes are not of a sensitive nature. The only identified potential risk is a confidentiality breach.

However, your confidentiality is a top priority, and we consistently work to ensure all information remains confidential. Hezel Associates will return the raw data to the SUNY TEAM staff members de-identified (e.g., your name will be removed for anonymity purposes).

Whenever one works with the internet, there is always the risk of compromising privacy, confidentiality, and/or anonymity. Your confidentiality will be maintained to the degree permitted by the technology being used. It is important for you to understand that no guarantees can be made regarding the interception of data sent via the internet by third parties.

Contacts and Questions

If you have general questions, concerns, or complaints about the study, you may contact any of the SUNY TEAM Investigators:

Cortney Harris, Project Director, Charris36@mcc.edu

Paula Hayes, SUNY CC Statewide Coordinator, TAACCCT Grant, Paula.Hayes@suny.edu

If you have any difficulties or questions about completing this questionnaire, you may contact Andrew Hayman from Hezel Associates, Andrew@hezel.com.

If you wish to address someone other than the investigators or evaluator you may contact the Institutional Research department at the campus you recently completed your degree at.

Statement of Consent: I read all the above information and received answers to any questions I asked. I may print off this page if I would like a copy of the informed consent form.

Do you consent to take the questionnaire?

- a) Yes
- b) No [*Go to Termination Page*]

Are you over 18 years of age?

- a) Yes
 - b) No [*Go to Termination Page*]
- [*Required question*]

Precaution message:

“Due to the design of this questionnaire, you will not have the option to return to previous pages once you click “continue”. You will have the ability to hit the browser’s “back” arrow button, but this will prevent you from being able to continue the questionnaire, so please avoid using this button. When you reach the final page of the questionnaire, you will click “submit”. You will only be able to complete the questionnaire one time, so please take your time to answer questions as accurately as possible.”

1) Which college have you attended since fall 2012? Choose one. If you have enrolled in more than one of these colleges, please choose the one where you enrolled more recently.

- a) Broome Community College (go to Q2(a))
- b) Cayuga Community College (go to Q2(b))
- c) Corning Community College (go to Q2(c))
- d) Erie Community College (go to Q2(d))
- e) Fulton Montgomery Community College (go to Q2(e))
- f) Hudson Valley Community College (go to Q2(f))
- g) Jamestown Community College (go to Q2(g))
- h) Mohawk Valley Community College (go to Q2(h))
- i) Monroe Community College (go to Q2(i))
- j) Onondaga Community College (go to Q2(j))
- k) Schenectady County Community College (go to Q2(k))
- l) Tompkins Cortland Community College (go to Q2(l))
- m) Ulster County Community College (go to Q2(m))

- n) None of these *[Go to Termination Page]*
[Required question]

2) In which Advanced Manufacturing program were you enrolled in since fall 2012?

Choose one. If you have enrolled in more than one program, please choose the one that you enrolled in most recently.

[Required question]

- a) Broome Community College
1. Mechanical Engineering Technology (A.A.S.)
 2. Other _____
 3. None *[Go to Termination Page]*
- b) Cayuga Community College
1. Advanced Manufacturing (CERTIFICATE)
 2. Mechanical Technology (A.A.S.)
 3. Other _____
 4. None *[Go to Termination Page]*
- c) Corning Community College
1. Electronic Technology: Electronics (A.A.S.)
 2. Machine Tool Technology (A.A.S.)
 3. Machine Tool Technology: Machine Operator (CERTIFICATE)
 4. Manufacturing Technology (A.A.S.)
 5. Mechanical Technology: CAD Design (A.A.S.)
 6. Other _____
 7. None *[Go to Termination Page]*
- d) Erie Community College
1. CNC Precision Machining (CERTIFICATE)
 2. Mechanical Engineering Technology (A.A.S.)
 3. Other _____
 4. None *[Go to Termination Page]*
- e) Fulton Montgomery Community College
1. Electrical Technology (A.A.S.)
 2. Other _____
 3. None *[Go to Termination Page]*
- f) Hudson Valley Community College
1. Electrical Technology: Semiconductor Manufacturing Technology (A.A.S.)
 2. Mechanical Engineering Technology (A.A.S.)
 3. Photovoltaic Installation (CERTIFICATE)
 4. Other _____
 5. None *[Go to Termination Page]*
- g) Jamestown Community College
1. Machine Tool Technology (CERTIFICATE)
 2. Mechanical Technology (A.A.S.)
 3. Other _____
 4. None *[Go to Termination Page]*
- h) Mohawk Valley Community College
1. CNC Machinist Technology (CERTIFICATE)

2. Machinist Technology (CERTIFICATE)
 3. Manufacturing Production Technology (A.O.S.)
 4. Mechanical Engineering Technology (A.A.S.)
 5. Semiconductor Manufacturing Technology (A.A.S.)
 6. Welding (CERTIFICATE)
 7. Welding Technology (A.O.S.)
 8. Other _____
 9. None *[Go to Termination Page]*
- i) Monroe Community College
1. Mechanical Technology (A.A.S.)
 2. Optical Systems Technology (CERTIFICATE)
 3. Optical Systems Technology (A.A.S.)
 4. Precision Machining (A.A.S.)
 5. Precision Machining: Optical Fabrication (CERTIFICATE)
 6. Precision Tooling (CERTIFICATE)
 7. Other _____
 8. None *[Go to Termination Page]*
- j) Onondaga Community College
1. Advanced Manufacturing – Machining (CERTIFICATE)
 2. Apprentice Training: Electrical Trades (A.A.S.)
 3. Electrical Engineering Technology (A.A.S.)
 4. Mechanical Technology (A.A.S.)
 5. Other _____
 6. None *[Go to Termination Page]*
- k) Schenectady County Community College
1. Alternative Energy Technology (A.A.S.)
 2. Nanoscale Materials Technology (A.A.S.)
 3. Storage Battery Technology (CERTIFICATE)
 4. Other _____
 5. None *[Go to Termination Page]*
- l) Tompkins Cortland Community College
1. Electrical Technology: Electronics & Computer Systems (A.A.S.)
 2. Electrical Technology: Electronics & Computer Systems (CERTIFICATE)
 3. Electrical Technology: Electronics & Computer Systems Level 1 (CERTIFICATE)
 4. Other _____
 5. None *[Go to Termination Page]*
- m) Ulster County Community College
1. Industrial Technology: Drafting & Design Technology (A.A.S.)
 2. Industrial Technology: Drafting & Design Technology (A.S.)
 3. Industrial Technology: Manufacturing Technology (CERTIFICATE)
 4. Other _____
 5. None *[Go to Termination Page]*

3) Why did you enroll in the program? *Mark all that apply.*

- a) Wanted a new career
- b) Wanted a promotion
- c) Wanted higher wages
- d) Personal interest in the field
- e) Previous employer closed
- f) Recommended by employer
- g) Recommended by family or friend
- h) Other _____

4) What was your educational goal when you entered the program? *Mark all that apply.*

- a) Complete individual course(s)
- b) Complete a training credential
- c) Complete an academic certificate
- d) Complete a 2-year degree
- e) Complete a 4-year degree
- f) Transfer to a 4-year institution
- g) Other _____

Employment Outcome Items

- 5) **Before you started your program of study, what was your employment status?**
- a) Employed full-time in my field of study
 - b) Employed full-time in another field
 - c) Employed part-time in my field of study
 - d) Employed part-time in another field
 - e) Not working
 - f) Retired
- 6) **Are you currently employed in your field of study?**
- a) Yes
 - b) No, I am employed in another field *[Go to Q11]*
 - c) No, I am not employed. *[Go to Q11] [Skip Q17 and Q18]*
- 7) **Choose which best describes your employment status since completing your program.**
- a) I am working with the same company I was at before I started the program. *[Go to Q10]*
 - b) I am working at a different company than I was working at before I started the program. *[Go to Q8] [Skip Q10]*
- 8) **How many weeks did it take you to find employment after completing the program?**
(Please enter the number of weeks, enter 0 if you had employment upon completion)
- _____
- 9) **When you started your new job, did you feel like you needed additional on-the-job training?**
- a) Yes
 - b) No
 - c) Do not know
- 10) **After completing the program, which best describes your status with your company?**
- a) I have the same job I had before I started the program.
 - b) I was promoted
 - c) I was laterally transferred
 - d) I was demoted
 - e) Unsure

11) Which of the following has occurred as a result of earning your certificate or degree?

	Yes	No	Do Not Know	Does Not Apply
Found a job in my field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Received a promotion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earn higher wages than before entering the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased confidence while in the workplace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel prepared to work in my field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12) Did you earn any of the following credentials or receive specialized training recognized by one the organizations listed below? Mark all that apply.

- a) Manufacturing Skill Standards Council Certified Production Technician (MSSC-CPT) *[Go to Q13]*
- b) National Career Readiness Certificate (NCRC) *[Go to Q13]*
- c) SME - Certified Manufacturing Technologist (CMfgt) *[Go to Q13]*
- d) Occupational Safety and Health Administration (OSHA) training *[Go to Q13]*
- e) Lean Six Sigma *[Go to Q13]*
- f) National Institute for Metalworking Skills (NIMS) *[Go to Q13]*
- g) American Welding Society (AWS) *[Go to Q13]*
- h) Other credential: _____ *[Go to Q13]*
- i) I did not earn any credentials *[Go to Q14]*
- j) Do not know *[Go to Q14]*

13) Which of the following has occurred due to you earning the credential(s)?

	Yes	No	Do Not Know	Does Not Apply
Found a job in my field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Received a promotion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earn higher wages than before entering the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased confidence while in the workplace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel prepared to work in my field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Program-Related Items

14) Please indicate your level of satisfaction with the following aspects of your program:

	0 Does Not Apply	1 Very Dissatisfied	2 Dissatisfied	3 Somewhat Unsatisfied	4 Neutral	5 Somewhat Satisfied	6 Satisfied	7 Very Satisfied
Ability to get Prior Learning Assessment (PLA) credit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Program (course) content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hands on experience (labs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technology based resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ToolingU courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learner Web	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internship opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job shadowing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job fairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Career counseling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Case managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15) Thinking about your current or future employment, please rate how much you agree or disagree with the following statements:

My Advanced Manufacturing program prepared me with the ability to do the following in a work setting...

	Does Not Apply	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Apply math skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply quality control knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply technical skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply writing skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effectively communicate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lead groups of people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manage my time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operate equipment used in the industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prioritize tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble-shoot technical problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use required computer software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work as a member of a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16) Instructions: Please mark whether or not you expected the following to be part of your program when you **started** and the degree to which those expectations were met.

	Did you expect the following to be a part of your program?		Expectations MET						
	Yes	No	1 Strongly Disagree	2 Disagree	3 Somewhat Disagree	4 Neutral	5 Somewhat Agree	6 Agree	7 Strongly Agree
Participating in an internship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completing online course work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving my math skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving my reading skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Receiving hands-on training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparing for work in my field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Workplace Behavior

17) Please indicate how frequently you do each of the following in your present job.

	Never	Rarely	Occasionally	Often	Very Often	Every Day
Took time to advise, coach, or mentor a co-worker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped co-worker learn new skills or shared job knowledge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteered to help a co-worker deal with a difficult customer, vendor, or co-worker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped new employees get oriented to the job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started or continued a damaging or harmful rumor at work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Said something obscene to someone at work to make them feel bad.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insulted or made fun of someone at work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insulted someone about their job performance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18) For each item below, please indicate the extent to which you agree with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
All in all, I am satisfied with my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, I don't like my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, I like working here.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trying to get my job done is a very frustrating experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being frustrated comes with this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, I experienced very little frustration on this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Demographics & Factors Influencing Program Completion

19) Were you a full-time or part-time student?

- a) Full-time
- b) Part-time
- c) Some full-time and some part-time

20) When did you start taking courses in the program? (Drop-down list)

- a) Fall 2011
- b) Spring 2012
- c) Summer 2012
- d) Fall 2012
- e) Spring 2013
- f) Summer 2013
- g) Fall 2013
- h) Spring 2014
- i) Summer 2014
- j) Fall 2014
- k) Spring 2015

21) When did you complete the program? (Drop-down list)

- a) Fall 2012
- b) Spring 2013
- c) Summer 2013
- d) Fall 2013
- e) Spring 2014
- f) Summer 2014
- g) Fall 2014
- h) Spring 2015

22) Did any of the following apply to you while you were enrolled?

	Yes	No	Do Not Know	Prefer not to answer
Veteran or spouse eligible for Priority of Service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TAA-eligible (Trade Adjustment Assistance benefits)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pell-eligible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student with a disability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23) What was the highest level of education you had completed prior to enrolling in the program?

- a) Completed some high school
- b) GED/High School diploma
- c) Associate degree
- d) Bachelor's degree
- e) Master's degree
- f) Doctoral degree
- g) Other:_____

24) What year did you complete your high school diploma or equivalency? *Drop down menu.*

25) Were you responsible for the cost of tuition or additional educational materials (e.g., books, materials, lab fees)?

- a) Yes, tuition and additional materials *[Go to Q26]*
- b) Yes, tuition only *[Go to Q26] [Skip Q27]*
- c) Yes, materials only *[Go to Q27]*
- d) No, tuition and materials are covered by benefits I qualify for *[Go to Q28]*

26) Do you feel the cost of tuition for your program was reasonable?

- a) Yes
- b) No

27) Do you feel the expenses (books, materials, lab fees) for your program were reasonable?

- a) Yes
- b) No

28) What year were you born?

- a) _____

29) What is your gender?

- a) Female
- b) Male
- c) Prefer not to answer

30) Which of the following best describes you?

- a) American Indian/Alaskan Native
- b) Asian
- c) Black/African American
- d) Hispanic/Latino
- e) Native Hawaiian/Other Pacific Islander
- f) White
- g) Other _____
- h) Prefer not to answer

Completion Page

Thank you for completing the questionnaire!

Termination Page

Unfortunately, your responses do not meet the criteria for this questionnaire. Thank you for participating!

APPENDIX C: SUNY TEAM WORK PLAN

Training & Education in Advanced Manufacturing (TEAM) Educational Pathways Work Plan			
Strategy 1: Develop and promote career pathways in advanced manufacturing with clear entry and exit points to meet trainees' education and employment needs.		Implementers: Colleges, SUNY Admin, Employers, Third-Party Content Experts	
Activities: Focus on start-up governance structures; detailed and high level analysis of requirements and solution design. <ul style="list-style-type: none">• Start-up administrative tasks: Hire staff; Contract process; Communications; Establish Steering Committee^{1.1}• Research educational and skill requirements for each occupational area.^{1.2}• Faculty teams develop uniform educational pathways in advanced manufacturing, assuring academic rigor and transferability.^{1.3}• Share final, approved educational pathways document across TEAM members and partners.^{1.4}• Strengthen articulation agreements throughout SUNY system modifying current policies to facilitate portability of credits.^{1.5}			
Milestones: Start-up and Pathways design phase successful; rollout to colleges, WIBs. <ul style="list-style-type: none">• All staff hired, contracts approved, and monthly Steering Committee meetings held.• Employer outreach and occupational data collected and used to design Educational Pathways; design approved by SUNY, colleges, MACNY, MANY, employer partners.• Educational Pathways rolled out to colleges and WIBs market to potential students.	Timeline	Total Costs	Equipment
	2/01/2013	Y1:\$505,527	Y1: \$98,175
	2/01/2013	Y2:\$318,452	Y2: \$0
	1/31/2014	Y3:\$310,956	Y3: \$0
		Y4:\$85,337	Y4: \$0
Deliverables: Fully developed and articulated NYS educational pathways in advanced manufacturing.			
Strategy 2: Build and offer uniform core & specialty curricula based on the DOL competency model incorporating NAM endorsed Advanced Manufacturing.		Implementers: Colleges, SUNY Admin, Employers, WIBs	
Activities: Focus on curriculum development for diverse adult learners to effectively address learning outcomes for job success. <ul style="list-style-type: none">• Define skill needs with MACNY, MANY, industry partners; Build accelerated curricular framework, focus on self-paced learning to promote heightened sense of commitment of worker, Write curricular content/supporting instructional materials using DOL knowledge, ideas, and experiences.^{2.1}• Incorporate stackable and latticed credentials offered through: NCRC, MSSC, NIMS, AWS, and SME.^{2.2}• Create one year for-credit/non-credit specialty technical certificates; Develop specialty courses to include: Six Sigma, OSHA.^{2.3}			

Milestones: Curricular models designed to meet needs of diverse adult learner. <ul style="list-style-type: none">• Curricula developed and consistent with partner community college expertise and industry need; revised core courses piloted by primary community college partners.• Embedded NAM certifications to include the MSSC, NIMS, AWS, SME, and Lean Six Sigma in uniform stackable core credentials within existing curricula.	Timeline 2/01/2013 1/31/2014	Total Costs Y1:\$3,205,357 Y2:\$502,044 Y3:\$325,524 Y4:\$85,337	Equipment Y1: \$1,698,376 Y2: \$19,368 Y3: \$0 Y4: \$0
Deliverables: Completed courses in uniform core and specialty areas based on industry requirements and adult learner principles; Industry-recognized portable and stackable credentials embedded in college-level certificates and degrees; Specialty curricula developed and aligned with the NYS Regional Economic Development Plans for Advanced Manufacturing.			
Strategy 3: Validate new and existing curriculum with industry and industry associations at the local, state, and national levels	Implementers: Colleges, SUNY Admin, Employers		
Activities: Focus on developing a validating mechanism for industry partners to engage with curriculum designers. <ul style="list-style-type: none">• Establish curriculum committees comprised of educators, employers, and industry associations.^{3.1}• Create validating mechanism framework (process) to allow industry partners and faculty identify areas of contradiction/agreement.^{3.2}• Provide joint faculty/employer training related to industry certification and skills standards to fully understand industry requirements.^{3.3}			
Milestones: Validation of the uniform curriculum. <ul style="list-style-type: none">• Process created to identify areas of agreement/contradiction and refine curriculum to the satisfaction of MACNY, MANY industry associations.• Common understanding developed of the psychosocial factors of adult learners based on competency models related to readiness to learn, motivation, and other attributes.	Timeline 2/01/2013 1/31/2014	Total Costs Y1:\$274,430 Y2:\$187,935 Y3:\$180,134 Y4:\$85,337	Equipment Y1: \$30,425.50 Y2: \$0 Y3: \$0 Y4: \$0
Deliverables: Steering Committee approval of uniform curricula.			
Strategy 4: Build and offer fast track developmental education curricula in support of Advanced Manufacturing programming.	Implementers: Colleges, SUNY Admin		
Activities: Focus on design and implementation of compressed, accelerated developmental programming. <ul style="list-style-type: none">• Research and select model programs in fast-track developmental education such as the I-BEST, ALP, Breaking Through, and the National Repository of Online Course; include integrated academic tutoring and student support.^{4.1}• Pilot program models at selected partner community colleges.^{4.2}			

Milestones: Fast Track basic skills courses rolled out to colleges. <ul style="list-style-type: none">• Courses selected/customized using diverse instructional techniques focused on self-paced, individualized instruction; Course selection to enhance workplace literacy and le skills to move worker quickly through remedial instruction and complete certificate.• Members of Collaborative work in partnership to share practices relating to developmental education.	Timeline 2/01/2013 1/31/2014	Total Costs Y1:\$320,493 Y2:\$170,818 Y3:\$149,001 Y4:\$85,337	Equipment Y1: \$30,424.50 Y2: \$0 Y3: \$0 Y4: \$0
Deliverables: Fast track developmental education programs implemented.			
Strategy 5: Offer core, specialty and developmental education courses via on-line and other alternative delivery formats.	Implementers: Colleges		
Activities: Focus on IT infrastructure; selection and customization of courses; establishing a social media forum <ul style="list-style-type: none">• Improve IT infrastructure to support growth in online learning by increasing network bandwidth and availability.^{5.1}• Coordinate delivery of core curricula with partner community colleges; implement centralized college calendar across SUNY.^{5.2}• Identify selected core and specialty courses for alternative delivery, including online delivery to facilitate self-paced learning;^{5.3}• Campuses will work with the SUNY Learning Network and SME ToolingU.com to offer full courses on-line; Develop competency-based assessments.^{5.4}			
Milestones: Improved infrastructure to support online learning; selection of core courses for online delivery; Learning Community established. <ul style="list-style-type: none">• IT infrastructure improvements purchased and in place to support major growth in online delivery of courses; Course selection customization completed and rollout scheduled.• Manufacturing Worker Learning Community established and integrates advanced manufacturing courses with basic skills courses.	Timeline 2/01/2013 1/31/2014	Total Costs Y1:\$704,086 Y2:\$248,121 Y3:\$184,879 Y4:\$85,337	Equipment Y1: \$30424.50 Y2: \$0 Y3: \$0 Y4: \$0
Deliverables: Statewide Action plan developed for enhancements related to online programming; Advanced Manufacturing programming at all 30 consortium colleges to contain an online complement, virtual, or simulation component.			
Strategy 6: Build and offer uniform statewide system for awarding academic credit through prior learning assessment.	Implementers: Colleges, SUNY Admin		
Activities: Focus on working with ETS to identify PLA assessments; schedule and offer PLA assessments to workers. <ul style="list-style-type: none">• Work with Empire State College to create uniform policies/practices for identifying credible work-based experiences.^{6.1}			

- Train faculty/staff on each campus to serve as evaluators for participants requesting academic credits based on previous work and life experiences; define “college-level learning” and how to assess it among TAA-eligible workers and veterans.^{6.2}

Milestones: Steering Committee to rollout PLA assessments across SUNY system. <ul style="list-style-type: none">• Creation of uniform statewide policies and practices.• Implementation of a state-wide system for evaluating PLA.• Prior learning and competency-based assessments chosen to assess allowable skills.• Professional development about PLA developed.	Timeline 2/01/2013 1/31/2014 1/31/2014 1/31/2014	Total Costs Y1:\$295,592 Y2:\$290,093 Y3:\$273,738 Y4:\$85,337	Equipment Y1: \$30424.50 Y2: \$0 Y3: \$0 Y4: \$0
Deliverables: Experiential credit permitted and implemented through prior learning assessment strategies and instruments.			
Strategy 7: Provide centralized student services through campus-based TEAM Centers working in partnership with the public workforce system.	Implementers: Colleges, WIBs		
Activities: Focus on creating SUNY wide Centers for customized on-demand support, guidance, and resources for workers. <ul style="list-style-type: none">• Each partner college establishes a TEAM Center – virtually or physically – with dedicated program coordinator or case manager.^{7.1}• Coordinator/case manager conducts outreach to college support services, i.e. academic advisors, financial aid and career counselors, industry and peer coaches/mentors, local public workforce systems, job placement services, and others to provide targeted case management services to enable workers/participants to accomplish specific education objectives.^{7.2}• Learner Web, web-based learner support system, implemented at campuses to assist with case management of students.^{7.3}			
Milestones: Campus-based Centers established on each participating campus. <ul style="list-style-type: none">• Centers established and connect employment, education, training and community support services into a coherent network of resources at the local and state level.• Centers integrate support services from local educational programs, social service organizations, one-stop offices, colleges, and community based organizations.	Timeline 2/01/2013 1/31/2015	Total Costs Y1:\$873,768 Y2:\$493,342 Y3:\$495,398 Y4:\$164,611	Equipment Y1: \$0 Y2: \$0 Y3: \$0 Y4: \$0
Deliverables: Accessible support services with linkages developed and made available to engage workers in economic empowerment by providing job readiness skills, training, employment and educational opportunities.			
Strategy 8: Build and implement a coordinated statewide approach to outreach, recruitment, and Earn and Learn models for the Advanced Manufacturing industry.	Implementers: Colleges, SUNY Admin, Employers		
Activities: Focus on marketing/recruitment efforts; Earn and Learn partnerships; Increasing worker/employer connections. <ul style="list-style-type: none">• MACNY and MANY collaborate with SUNY Collaborative to build and rollout an outreach and recruitment plan using the existing advanced manufacturing infrastructure across NYS; Coordinate media efforts including a website, webinars, and print materials.^{8.1}			

- Conduct the NAM “Dream It, Do It” awareness campaign; Conduct career exploration camps, student-in-the-workplace and teacher-in-the-workplace programs for targeted stakeholder groups including workers and college faculty.^{8.2}

Milestones: Outreach and recruitment plan finalized and implemented.	Timeline	Total Costs	Equipment
• Job fairs conducted and employer networking sessions to increase connections between employers, participants, and community colleges, WIBs/One-Stops.	2/01/2015	Y1:\$482,504	Y1: \$0
• Innovative partnerships established between employers and colleges/universities to help workers complete their education while working in high need fields.	1/31/2016	Y2:\$496,673	Y2: \$0
		Y3:\$517,908	Y3: \$0
		Y4:\$85,337	Y4: \$0
Deliverables: Approach aligned with the NYS Regional Economic Development Plans for Advanced Manufacturing.			

APPENDIX D: STUDENT QUESTIONNAIRE RESPONDENT PROFILE

The data presented in this appendix reflect information from students who completed the questionnaire in Year 4.

Table D1. Respondent Gender

Gender	Number of responses (n = 59)	Percent of responses
Male	45	76.3
Female	6	10.2
Did not answer	8	13.6

Table D2. Respondent Age

Age range	Number of responses (n = 59)	Percent of responses
18-24	12	20.3
25-35	18	30.5
36-45	8	13.6
46-55	6	10.2
56 or older	8	13.6
Did not answer	7	11.9

Table D3. Respondent Ethnicity

Race/ethnicity	Number of responses (n = 59)	Percent of responses
American Indian or Alaskan Native	0	0.0
Asian	1	1.7
Black or African American	1	1.7
Hispanic or Latino	3	5.1
Native Hawaiian or Other Pacific Islander	1	1.7
Caucasian	44	74.6
Other	2	3.4
Did not answer	7	11.9

^aOther responses include: Researching full ethnicity presently.

Table D4. Respondent Student Status

Status	Number of responses (n = 52)	Percent of responses
Fulltime	43	82.7
Part-time	5	9.6
Some fulltime and some part-time	4	7.7

Table D5. Respondent Status

Status	Number of responses	Percent of responses
Pell recipient (n = 50)	13	25.5
TAA-eligible (n= 50)	6	12.0
Veteran or spouse eligible for priority of service (n = 51)	4	8.0
Student with a disability (n = 51)	4	7.8

Note. Respondents selected Yes or No to each item and were able to choose more than one answer.

Table D6. Highest Level of Education Completed before Enrollment

Highest level of education	Number of responses (n = 51)	Percent of responses
Completed some high school	4	7.8
High school diploma/GED	29	56.9
Bachelor's degree	5	8.5
Associate's degree	10	19.6
Master's degree	2	3.9
Doctoral degree	1	2.0

Table D7. Motivations for Enrollment in SUNY TEAM Program

Status	Number of responses (n = 95)	Percent of responses
Personal interest in the field	28	29.5
Wanted a new career	29	30.5
Wanted higher wages	17	17.9
Previous employer closed	8	8.4
Recommended by family or friend	8	8.4
Recommended by employer	1	0.8
Wanted a promotion	4	4.2

Note. Respondents were able to choose more than one answer.

Table D8. Educational Goals

Goal	Number of responses (n = 83)	Percent of responses
Complete a 2-year degree	34	41.0
Transfer to a 4-year institution	9	10.8
Complete an academic certificate	18	21.7
Complete a 4-year degree	8	9.6
Complete a training credential	7	8.4
Complete individual courses	7	8.4

Note. Percentages may not equal 100.0% due to rounding and missing responses. Programs in which there were no respondents are not represented in the table. Respondents were able to choose more than one answer.

Table D9. Semester Students Entered SUNY TEAM Programs

Response	Number of responses (n = 52)	Percent of responses
Fall 2011	4	7.7
Spring 2012	4	7.7
Fall 2012	15	28.8
Spring 2013	3	5.8
Summer 2013	2	3.8
Fall 2013	13	25.0
Spring 2014	4	7.7
Fall 2014	5	9.6
Fall 2015	2	3.8

Table D10. Semester Students Completed SUNY TEAM Programs

Response	Number of responses (n = 50)	Percent of responses
Spring 2013	2	4.0
Summer 2013	1	2.0
Spring 2014	3	6.0
Summer 2014	2	4.0
Fall 2014	14	28.0
Spring 2015	25	50.0
Fall 2015	3	6.0

Table D11. Respondents by Program

College	Program	Number of responses (n = 57)	Percent of responses
Broome	Mechanical Engineering Technology AAS	3	5.3
Cayuga	Mechanical Technology AAS	4	7.0
Corning	Electronic Technology Electronics AAS	-	-
	Machine Tool Technology AAS	1	1.8
	Mechanical Technology CAD Design AAS	2	3.5
Erie	CNC Machining Certificate	1	1.8
FMCC	Electrical Technology AAS	2	3.5
HVCC	Electrical Technology Semiconductor Manufacturing	3	5.3
	Mechanical Engineering Technology AAS	1	1.8
Jamestown	Mechanical Technology AAS	5	8.8
	Machine Tool Technology Certificate	1	1.8
MVCC	Mechanical Engineering Technology AAS	1	1.8
Monroe	Mechanical Technology AAS	3	5.3
	Optical Systems Technology AAS	4	7.0
	Precision Machining AAS	3	5.3
	Precision Machining Optical Fabrication Certificate	2	3.5
	Precision Tooling Certificate	8	14.0
	Other	1	1.8
Onondaga	Electrical Engineering Technology AAS	6	10.5
	Mechanical Technology AAS	2	3.5
	Advanced Manufacturing Machining Certifications	1	1.8

College	Program	Number of responses (n = 57)	Percent of responses
Schenectady County	-	-	-
TC3	Electrical Technology Electronics and Computer Systems	1	1.8
Ulster County	-	-	-
None of these	-	2	3.5

Note. Percentages may not equal 100.0% due to rounding and missing responses. Schenectady County Community College and Ulster County Community College had no respondents.

APPENDIX E: OUTCOMES STUDY PARTICIPANT DEMOGRAPHIC PROFILE

Table E1. Student Participant Age by College

College	n	Mean	SD
Cayuga County	95	27.19	8.93
Erie	312	27.70	8.54
Fulton-Montgomery	105	28.33	10.11
Hudson Valley	62	24.85	5.79
Mohawk Valley	310	26.78	8.83
Monroe	570	29.61	10.85
Onondaga	461	26.98	9.08
Schenectady County	104	30.71	10.00
Ulster County	23	29.22	11.91

Table E2. Student Participant Gender by College

College	n	Percentage	
		Male	Female
Cayuga County	95	88	12
Erie	312	93	7
Fulton-Montgomery	105	92	8
Hudson Valley	62	90	10
Mohawk Valley	310	92	8
Monroe	570	92	8
Onondaga	462	94	7
Schenectady County	104	86	14
Ulster County	23	83	17

Table E3. Student Participant Race/Ethnicity by College

College	n	Percentage								
		AIAN	A	B/AA	H/L	NHPI	W	NA	Mult.	Unk.
Cayuga County	95	2.1	-	3.2	3.2	-	89.5	-	2.1	-
Erie	312	1.3	3.5	5.8	2.6	-	63.8	0.6	2.6	19.9
Fulton-Montgomery	105	-	-	4.8	10.5	-	69.5	8.6	1.9	4.8
Hudson Valley	62	-	8.1	4.8	1.6	-	80.6	-	4.8	-
Mohawk Valley	310	-	4.2	6.5	6.8	0.6	79.0	-	2.9	-
Monroe	570	0.7	3.3	8.6	4.7	0.4	79.5	0.4	2.5	-
Onondaga	462	0.4	7.1	13.9	5.2	0.2	64.9	0.4	5.2	2.6
Schenectady County	104	1.9	6.7	10.6	6.7	1.0	67.3	-	3.8	1.9
Ulster County	23	-	-	8.7	8.7	-	73.9	-	4.3	4.3

Note. AIAN = American Indian/Alaska Native, A = Asian, B/AA = Black/African American, H/L = Hispanic/Latino, NHPI = Native Hawaiian/Pacific Islander, W = White, NA = Non-resident alien, Mult. = Two or more races, and Unk. = Unknown.

Table E4. Student Participant Mean Age for 7 Technical Track Programs

Program	n	Mean	SD
CCC Advanced Manufacturing	3	27.67	12.50
OCC Advanced Manufacturing – Machining	26	29.19	11.55
FMCC Automation Systems: Mechatronics	2	22.00	4.24
ECC CNC Precision Machining	165	30.28	9.71
UCCC Industrial Technology: Manufacturing Technology	3	31.00	9.64
MVCC Mechatronics	11	37.09	12.45
CCC Plastics Manufacturing	1	27.00	-

Table E5. Student Participant TAP, Pell, and Veteran for 7 Technical Track Programs

Program	n	TAP Recipients	PELL Recipients	Veterans
CCC Advanced Manufacturing	3	0	1	0
OCC Advanced Manufacturing – Machining	26	8	8	0
FMCC Automation Systems: Mechatronics	2	0	0	0
ECC CNC Precision Machining	165	46	44	9
UCCC Industrial Technology: Manufacturing Technology	3	2	0	0
MVCC Mechatronics	11	8	4	0
CCC Plastics Manufacturing	1	1	0	0

Table E6. Student Participant Race/Ethnicity for 7 Technical Track Programs

Program	n	W	B/AA	H/ L	A	Oth.	Unk.
CCC Advanced Manufacturing	3	2	1	-	-	-	-
OCC Advanced Manufacturing – Machining	26	17	5	2	2	-	-
FMCC Automation Systems: Mechatronics	2	2	-	-	-	-	-
ECC CNC Precision Machining	165	116	10	5	1	5	28
UCCC Industrial Technology: Manufacturing Technology	3	-	-	1	-	1	1
MVCC Mechatronics	11	10	-	1	-	-	-
CCC Plastics Manufacturing	1	1	-	-	-	-	-

Note. W = White, B/AA = Black/African American, H/L = Hispanic/Latino, A = Asian, Oth. = Other, and Unk. = Unknown.

APPENDIX F: MILESTONE CHECKLIST

Table F1. Milestone Completion

Number	Strategies/Milestones	Timeline	Milestone Completion (Y/N)	Completed on Time (Y/N)
Strategy 1: Develop and promote career pathways in advanced manufacturing with clear entry and exit points to meet trainees' education and employment needs.				
1.0	Milestones: Start-up and Pathways design phase successful; rollout to colleges, WIBs.	1/31/2014	Y	N
1.1	All staff hired, contracts approved, and monthly Steering Committee meetings held.	2/1/2013	Y	N
1.2	Employer outreach and occupational data collected and used to design Educational Pathways; design approved by SUNY, colleges, MACNY, MANY, employer partners.	2/1/2013	Y	Y
1.3	Educational Pathways rolled out to colleges and WIBs market to potential students.	1/31/2014	Y	N
Strategy 2: Build and offer uniform core & specialty curricula based on the DOL competency model incorporating NAM endorsed Advanced Manufacturing.				
2.0	Milestones: Curricular models designed to meet needs of diverse adult learner.	1/31/2014	Y	N
2.1	Curricula developed and consistent with partner community college expertise and industry need; revised core courses piloted by primary community college partners.	2/1/2013	Y	N
2.2	Embedded NAM certifications to include the MSSC, NIMS, AWS, SME, and Lean Six Sigma in uniform stackable core credentials within existing curricula.	1/31/2014	Y	Y
Strategy 3: Validate new and existing curriculum with industry and industry associations at the local, state, and national levels				
3.0	Milestones: Validation of the uniform curriculum.	1/31/2014	Y	Y
3.1	Process created to identify areas of agreement/contradiction and refine curriculum to the satisfaction of MACNY, MANY industry associations.	2/1/2013	Y	Y
3.2	Common understanding developed of the psychosocial factors of adult learners based on competency models related to readiness to learn, motivation, and other attributes.	1/31/2014	Y	Y
Strategy 4: Build and offer fast track developmental education curricula in support of Advanced Manufacturing programming.				
4.0	Milestones: Fast Track basic skills courses rolled out to colleges.	1/31/2014	Y	Y

Number	Strategies/Milestones	Timeline	Milestone Completion (Y/N)	Completed on Time (Y/N)
4.1	Courses selected/customized using diverse instructional techniques focused on self-paced, individualized instruction; Course selection to enhance workplace literacy and le skills to move worker quickly through remedial instruction and complete certificate.	2/1/2013	Y	Y
4.2	Members of Collaborative work in partnership to share practices relating to developmental education.	1/31/2014	Y	Y
Strategy 5: Offer core, specialty and developmental education courses via on-line and other alternative delivery formats.				
5.0	Milestones: Improved infrastructure to support online learning; selection of core courses for online delivery; Learning Community established.	1/31/2014	Y	Y
5.1	IT infrastructure improvements purchased and in place to support major growth in online delivery of courses; Course selection customization completed and rollout scheduled.	2/1/2013	Y	Y
5.2	Manufacturing Worker Learning Community established and integrates advanced manufacturing courses with basic skills courses.	1/31/2014	Y	Y
Strategy 6: Build and offer uniform statewide system for awarding academic credit through prior learning assessment.				
6.0	Milestones: Steering Committee to rollout PLA assessments across SUNY system.	1/31/2014	Y	N
6.1	Creation of uniform statewide policies and practices.	2/1/2013	Y	N
6.2	Implementation of a state-wide system for evaluating PLA.	1/31/2014	N	N
6.3	Prior learning and competency-based assessments chosen to assess allowable skills.	1/31/2014	Y	N
6.4	Professional development about PLA developed.	1/31/2014	Y	N
Strategy 7: Provide centralized student services through campus-based TEAM Centers working in partnership with the public workforce system.				
7.0	Milestones: Campus-based Centers established on each participating campus.	1/31/2015	Y	N
7.1	Centers established and connect employment, education, training and community support services into a coherent network of resources at the local and state level.	2/1/2013	Y	N

Number	Strategies/Milestones	Timeline	Milestone Completion (Y/N)	Completed on Time (Y/N)
7.2	Centers integrate support services from local educational programs, social service organizations, one-stop offices, colleges, and community based organizations.	1/31/2015	Y	N
Strategy 8: Build and implement a coordinated statewide approach to outreach, recruitment, and Earn and Learn models for the Advanced Manufacturing industry.				
8.0	Milestones: Outreach and recruitment plan finalized and implemented.	1/31/2016	Y	Y
8.1	Job fairs conducted and employer networking sessions to increase connections between employers, participants, and community colleges, WIBs/One-Stops.	2/1/2015	Y	Y
8.2	Innovative partnerships established between employers and colleges/universities to help workers complete their education while working in high need fields.	1/31/2016	Y	Y

APPENDIX G: PROGRAMS INCLUDED IN OUTCOMES STUDY

Primary Campus Name	Academic Program Name	Award Name
Cayuga County	Plastics Manufacturing – Technical Track	CERT
	Advanced Manufacturing – Technical Track	CERT
	Mechanical Technology	A.A.S.
Erie	Mechanical Engineering Technology	A.A.S.
	CNC Precision Machining – Technical Track	CERT
Fulton-Montgomery	Electrical Technology	A.A.S.
	Automation Systems: Mechatronics – Technical Track	CERT
Hudson Valley	Electrical Technology: Semiconductor Manufacturing Technology	A.A.S.
Mohawk Valley	Manufacturing Production Technology	A.O.S.
	Semiconductor Manufacturing Technology	A.A.S.
	Mechanical Engineering Technology	A.A.S.
	Mechatronics – Technical Track	CERT
	Machinist Technology	CERT
	CNC Machinist Technology	CERT
	Welding	CERT
	Welding Technology	A.O.S.
Monroe	Optical Systems Technology	CERT
	Optical Systems Technology	A.A.S.
	Precision Machining Optical Fabrication	CERT
	Mechanical Technology	A.A.S.
	Precision Tooling	CERT
	Precision Machining	A.A.S.
	Precision Machining	A.A.S.
Onondaga	Advanced Manufacturing - Machining- Technical Track	CERT
	Electrical Engineering Technology	A.A.S.
	Mechanical Technology	A.A.S.
	Apprentice Training, Electrical	A.A.S.
Schenectady County	Nanoscale Materials Technology	A.A.S.
	Storage Battery Technology	CERT
	Alternative Energy Technology	A.A.S.
Ulster County	Industrial Technology: Manufacturing Technology – Technical Track	CERT
	Industrial Technology: Drafting & Design Technology	A.A.S.
	Industrial Technology: Drafting & Design Technology	A.S.