THE OHIO TECHNICAL SKILLS INNOVATION NETWORK (OHIO TECHNET)

TRADE ADJUSTMENT ASSISTANCE COMMUNITY COLLEGE CAREER TRAINING GRANT (TAACCCT)

FINAL EVALUATION REPORT

September 30th, 2018

Table of Contents

Evaluation conducted by:

The New Growth Group, LLC

New Growth is a workforce consulting group that mobilizes businesses and communities to solve workforce challenges. The organization has provided evaluation and analytics, strategic planning, grant and resource development, and operations support to over 100 workforce organzations and colleges in 20 states. www.newgrowthgroup.com

The Ohio Education Research Center at The Ohio State University

The OERC conducts research using administrative data available through the Ohio Analytics partnership, which centralizes state administrative data into a single data repository, the Ohio Longitudinal Data Archive (OLDA). OERC provides high-quality research products using a variety of methods and data sources, including case studies, environmental scans, literature reviews and survey research. www.oerc.osu.edu

Executive Summary

The Ohio Technical Skills Innovation Network (Ohio TechNet or OTN) initiative launched in Ohio in response to an evolving manufacturing industry being propelled into the automation era. Grant leaders had observed that the industry was more productive and efficient than ever; at the grant's outset, it was the largest industry by GDP in the state, yet only the 3rd largest by employment. Since 2005 Ohio's manufacturing employment had decreased by over 125,000 jobs, or fifteen percent of jobs; yet, the state's manufacturing output increased by over one-third or nearly $25 billion. This evolution was driven by the adoption of new production technologies and processes that postsecondary institutions needed to incorporate into their programs.

The demand for workers who could thrive in a highly efficient and automated environment was high according to research done by project leaders. For example, skilled trades and installation and repair specializations were among the fastest growing occupations in the industry – outpacing trends among lower-skilled production occupations. These higher demand occupations require postsecondary technical and "adaptive" skillsets that involve critical thinking and complex problem solving, which enable companies to evolve along with technology. Workers without these skillsets are vulnerable to displacement as the industry continues to change, so a major emphasis emerged to prepare people, including many who were already working in manufacturing, into higher skilled forms of manufacturing employment.

In Fall 2014, the Ohio TechNet consortium was comprised of eleven community colleges in Ohio that partnered to address workforce challenges in advanced manufacturing. The consortium received $15 million to invest in the design and delivery of manufacturing education, providing student supportive services, promoting collaboration among member colleges and other partners for the purposes of increasing the grant's impact, and working more closely with industry partners. This is the final third-party evaluation report, which summarizes the initiative's accomplishments and challenges and assesses the impact on participants using a quasi-experimental methodology.

A detailed description of the project is included in Appendix A on page 38. Adult postsecondary students, un- and under-employed individuals, and incumbent workers were targeted for participation in the grant, with special focus on adults transitioning to new careers, trade-affected and dislocated workers, and veterans. The OTN colleges worked to improve programs and pathways in five programmatic areas: Welding; CNC/Machining; Industrial Maintenance; Digital Fabrication/Industrial Automation; and Occupational Safety.

Three strategies outlined in the design of the project guided the activities of the colleges:

- Strategy 1: Create mechanisms for statewide collaboration among consortium partners and economic and workforce development allies that help advance Ohio's innovation economy.
- Strategy 2: Transform instructional design and delivery systems for customization to individual student needs and rapid response to labor market demand.
- Strategy 3: Expand best practices that redesign student intake, success, and placement.

A non-exhaustive list of key metrics for tracking progress and outcomes included program enrollments, program completions, credentials earned, individuals continuing in further education, employment status following program completion, and earnings.

Evaluation Design Summary

There are two parts to the evaluation: (1) an implementation evaluation that captured qualitative elements of project implementation, the extent to which the colleges implemented according to the original blueprint of the project, and lessons learned leading to adjustments in the plan; and (2) an impact evaluation that measured the effect of grant activities on credit attainment, program completion, job attainment, and participant earnings using a quasi-experimental approach.

Implementation Evaluation Design

The implementation evaluation had three goals: (1) to assess fidelity to the original blueprint, (2) to identify factors affecting outcomes, and (3) to capture elements of implementation affecting changes to the plan. Inquiries were conducted via surveys, interviews, and site visits and sought to capture enabling or hindering factors affecting participant and consortium-level outcomes along with resulting changes in the project. Broadly, the implementation evaluation posed the following questions:

- What is being implemented, and how is it theorized to drive impacts?
- Has implementation occurred on time and as intended?
- Is there fidelity to the intent? When variation exists, is it effective and consistent with project outcomes?

Impact Evaluation Design

The primary impact question posed in OTN's original proposal to DOL is: "What is the impact of the OTN project on participants and other adult learners, particularly with regard to completion and employment rates?" An assessment of the impacts on student enrollment, credit attainment, postsecondary retention, postsecondary completion, job attainment, job retention, and earnings is also included. The evaluation operates at the program level.

The impact study uses a comparison group design, which is described in further detail in the Impact Evaluation section starting on page 27. Participants consisted of students enrolled in an OTN grant-affected program or core course. A comparison group was constructed using a propensity score matching methodology that produced a 1:1 match for each participant. Comparison group individuals were enrolled in non-OTN institutions, in the same subject area (program or course) based on a system of statewide administrative codes, and demographically similar to participants.

Outcomes/Impact Analysis Research Questions

The impact evaluation questions align with the DOL reporting requirements for the annual performance report. For each question listed, grant participants in the grant-affected programs were compared to comparison group members:

1. How many unique participants/comparisons have been served?
2. How many individuals have completed a grant/comparison program of study?
    a. Of those, how many are incumbent workers?

3. How many individuals are still retained in their program of study (or other grant-funded program)?
4. How many individuals are retained in other education programs?
5. How many credit hours have been completed?
    a. How many students have completed credit hours?
6. How many credentials have been earned by participants/ comparisons?
    a. How many students have earned certificates (<1 year)?
    b. How many students have earned certificates (>1 year)?
    c. How many students have earned degrees?
7. How many students are pursuing further education after program of study completion?
8. How many participants/comparisons are employed after program of study completion?
9. How many participants/ comparisons are retained in employment for three quarters after program of study completion?
10. What are the earnings of participants/ comparisons relative to before enrollment?
    a. How many of those employed at enrollment received a wage increase post-enrollment?
11. What is the time-to-completion of participants / comparisons?

Implementation Findings

The Ohio TechNet initiative accomplished its objectives. It successfully met the deliverables and objectives of a $15 million federal grant that was focused on improving collaboration among disparate entities in the state, improving labor-responsive programming in manufacturing, and encouraging student success.

The initiative provided resources for community colleges to keep pace with evolving employer needs by providing funding, professional development opportunities, numerous tools and resources, and connections to a network of state and national partners. Two of the grant's strategies were dedicated to these elements, and colleges implemented activities accordingly. The primary means for keeping pace with the changing manufacturing economy was to invest in programs. The colleges used grant dollars to develop or improve 146 programs including associate degrees, postsecondary certificates, and noncredit programs. Investments included new equipment/supplies and space renovations, the hiring and training of qualified faculty and staff, and new or improved curricula. Curricular improvements included models for acceleration, contextualization, stackable credentials, integration of industry-recognized credentials, work-based learning including apprenticeships and internships, credit award for prior learning, and competency-based education. Over 500 employers and 50 community organizations were engaged in the initiative working in partnership with colleges. Of note, partner colleges reported that they leveraged an additional $2.85 million in public and private resources to expand the impact of OTN grant activities.

Additionally, the grant operationalized an approach for connecting networks of collaborators throughout the state and nation. One strategy of the grant was dedicated to working to improve collaborations. The initiative established an effective project management and communication infrastructure, including an integrated data and performance management infrastructure. As a result, several state and national initiatives were able to align with and leverage the Ohio TechNet initiative.

Participant Impacts and Outcomes

In a quasi-experimental analysis, OTN participants outperformed comparison group members in several outcomes:

- Participants had higher rates of completion (+8.2 percentage points) and program retention (+12.2 percentage points) than comparisons.
- Of those enrolled in for-credit programs, participants had higher rates of completing any credit hours (+13.3 percentage points); and similar numbers of credits were completed per term among participants and comparisons.
- Participants had higher rates of continuation into further education at a different college (+15.1 percentage points).

This appears to be the result of three factors: (1) increased focus on employer-aligned programs, (2) integration of student-focused delivery models and services, and (3) significant reconfiguration of programs around shorter-term post-secondary and industry-recognized credentials. This is demonstrated in several ways:

- More credentials were earned during the grant period (1.6 for participants vs. 1.3 for comparisons).
- More short-term certificates <1yr (+43.9 percentage points) resulted in the participant group.
- Comparisons were much more focused on 2-year degrees (+40.2 percentage points more than participants).
- More participants earned any credential (+8.2 percentage points).

Participants experienced successful labor market outcomes, although did not always outperform the comparison group.

- 73% of all participants became employed or experienced an earnings increase after program completion; 60% of participants unemployed at enrollment became employed within the first year after program completion; 80% of participants employed at enrollment experienced an earnings increase after program completion, compared to earnings three months before enrollment.[1]
- Overall, participant earnings increased by 39%. ($24,800/yr on average prior to enrollment and $34,500 four quarters after program completion); participants unemployed at enrollment experience an average earnings increase from $9,900/ yr in the year prior to enrollment to $25,000/ yr four quarters after program completion; participants that were employed at enrollment experienced an average earnings increase from $26,800/ yr to $37,400/ yr.
- Unemployed completers had a higher rate of employment in the first quarter after completion and were retained in employment at a higher rate for the first three quarters after completion than unemployed comparisons.
- However, while the majority of incumbent participants experienced ‘any earnings increase’ post-completion, comparison group members who were incumbent workers similarly achieved ‘any earnings increase’ post-completion.

[1] Calculated in a supplemental analysis of participants who enrolled in Winter 2017 or earlier and were therefore eligible for measurement of 1 year employment outcomes.

Conclusion

The focus on employer-aligned programs, integration of student-focused delivery models, and significant reconfiguration of programs around shorter-term programming resulted in increased completion rates, program retention rates, higher rates of continuation into further education at other institutions, higher credential attainment rates, and higher share of people completing credit hours among participants relative to comparisons. Additionally, participants experienced higher post-completion employment rates for non-incumbent workers in the first three quarters after completion. And, while earnings increased by nearly 40% relative to pre-enrollment for participants that completed programs, overall there was no difference between participants and the comparison group in the proportion of incumbent workers who experienced an earnings increase after enrollment.

Implementation Evaluation

Overall, the colleges met the intent and deliverables of the grant. A table is included in Appendix B on page 44 that lists the deliverables in the grant's scope of work and provides a detailed summary of grant activities to meet the deliverables. Throughout the grant's implementation, project leaders highly emphasized an intent for colleges to engage with businesses in deeper ways, establishing new relationships to meet hiring, productivity, and upskilling needs for companies. As such, this theme received focused attention throughout the evaluation. The grant's outcomes goals and actual performance are listed in Table 1 below. It is possible employment results could improve by the time the final annual performance report is submitted for the project due to time passing and the arrival of new data after the submission of this evaluation report.

Table 1: Performance Outcomes

Outcome	Goal	Actual
1. Unique Participants Enrolled	1,801	2,248
2. Total Number of Participants Completing a Grant-Funded Program of Study	1,075	1,033
3. Total # of participants still retained in their program of study or other TAACCCT-funded program	559	341
4. Total # of participants completing credit hours	1,360	1,523
5. Total Number of participants Earning Credentials	942	1,040
6. Total Number of Participants Enrolled in Further Education After TAACCCT-funded Program of Study Completion	246	157
7. Total Number of Participants (Unemployed at Enrollment) Employed After TAACCCT-funded Program of Study Completion	851	107
8. Total Number of Participants (Unemployed at Enrollment) Retained in employment 3 Quarters After Program of Study Completion	740	73[2]
9. Total Number of Participants Employed at Enrollment Who Received an Earnings Increase Post-Enrollment	384	1,025

The numbers in the above table show the performance of the consortium relative to what was projected in the original grant proposal. The consortium exceeded the number of participant enrollments (1) that were projected; approximately achieved the number of completions projected; and exceeded the goal for total earned certificates, degrees, or credentials. These outcomes encapsulate a major storyline of this initiative, which was that the grant extensively focused and invested in the development and integration of shorter-term, stackable certificates and industry credentials. This resulted in the large number of participants who earned certificates/ degrees/ and credentials, and was an important factor in the comparison group analysis because comparable individuals did not participate in programs that had undergone similar transformative processes.

[2] Minimum estimate

In the original proposal, the consortium's grant writers and leaders misinterpreted (due to vague guidance from the funder) that post-completion employment was measured for all individuals rather than only for individuals that were unemployed at the time of enrollment, which was the actual grant-required definition and a much narrower group. Only 30 percent of grant participants were unemployed at the time of enrollment. As a result, post-completion employment outcomes (#7 above) were below the projected goal. The same explanation holds for the number of participants retained in employment in the 3rd quarter after completion and exit (#8 above). Finally, the total number of individuals employed at enrollment that received a wage increase greatly exceeded the projected goal mostly due to a larger than anticipated share of incumbent workers enrolled in grant-funded programs.

Table 2, below, provides the demographics of program participants. The participants were largely male and white with an average age of 30.

Table 2: Demographics

Demographics	
Male/ Female	89.5%/ 10.5%
Average Age at Enrollment	30
Unemployed/ Working at Enrollment	30.5%/69.5%
White/ Minority	85%/ 15%
Median Annual Earnings At Enrollment	$27,895
Veteran Status	5.4% (122 individuals)
Trade Affected Status	2.8% (62 individuals)

Early Stage Challenges

Although the project achieved overall success in achieving the intent and deliverables of the project, a majority of project managers at the OTN colleges commented that the early stages of the project were particularly challenging due to a variety of start-up issues. Key challenges included:

(1) Determining a local definition of participants, which required schools to meet USDOL and consortium guidelines, enable maximum participation numbers, and focus efforts for maximum benefits to targeted programs.

(2) Accommodating lengthy timeframes for USDOL budget change requests and equipment and renovation approvals.

(3) Participant recordkeeping and data management amid evolving requirements and requests; especially, management of the need to do aggressive participant outreach to assemble records of post-completion employment outcomes.

(4) Aggressive push to achieve timely program launch at the grant outset. Slow-downs included program approvals, instructor hiring, and early-stage recruitment efforts to drive grant enrollment numbers early in the grant timeline.

Colleges Used the Ohio TechNet Grant to Keep Pace with the Changing Manufacturing Economy

Ohio TechNet provided resources for community colleges to keep pace with evolving employer needs by providing funding, professional development opportunities, numerous tools and resources, and connections to a network of state and national partners. Colleges used the funds to redevelop curricula, focus on accelerated and flexible programming, infuse modern technologies into programs, update training spaces, hire skilled instructors, provide supportive services to students, and advance partnerships with businesses and other organizations. Two of the grant's strategies were dedicated to these elements, and colleges implemented activities accordingly.

Grant Strategy: Transform instructional design and delivery systems for customization to individual student needs and rapid response to labor market demand.

The primary means for keeping pace with the changing manufacturing economy was to invest in programs. The colleges used grant dollars to develop or improve 146 programs including associate degrees, postsecondary certificates, and noncredit programs. Investments included new equipment/supplies and space renovations, the hiring and training of qualified faculty and staff, and new or improved curricula. Curricular improvements included models for acceleration, contextualization, stackable credentials, integration of industry-recognized credentials, work-based learning including apprenticeships and internships, credit award for prior learning, and competency-based education. Of note, partner colleges reported that they leveraged an additional $2.85 million in public and private resources to expand the impact of OTN grant activities.

In interviews, the OTN college's Project Managers were asked to describe what is different or innovative about the programs their college implemented under the grant. Across colleges, responses to this question were summarized in two themes: 1) improved program content, structure, and/or delivery method; and 2) innovative uses of technology and space.

Improved program content, structure, and/or delivery method:

- Strengthened pathways by integrating industry credentials: Nearly every college in the consortium integrated industry credentials into programmatic pathways, such as NIMS, AWS, and FANUC. This was accompanied by the development of career pathways maps, and the adoption of stacked or latticed postsecondary credentials aligned with industry credentials. Rhodes State College, for example, worked with industry partner CIFT (Center for Innovative Food Technology) to develop a new food technology pathway leading to a food technology certificate, and eventually an associate degree is planned. In total, Rhodes implemented four pathway programs under the grant, all of which embedded industry-recognized credentials: including FANUC, MSSC CPT, ServSafe, HACCP, NIMS tool and die (machining), and NIMS industrial maintenance (welding).
- Creation or adjustment of stacked and latticed credentials: Colleges created or improved stacked or latticed credentials establishing more opportunities for step-wise advancement for students. In total, 56 new programs were created. These included 33 postsecondary certificates and 4 degrees; the remainder led to industry-recognized credentials. At Lakeland Community College, for example, the welding program was

re-organized from longer certificates into a series of shorter-term certificates leading to an associate degree; the program was changed from an Associate of Technical Studies to an Associate of Applied Science and an articulation agreement with a four-year college is in process. Classes were offered on Saturdays and expanded times during the week to better meet students' needs. And, changes to the program allowed students to apply for financial aid to pursue the shorter-term certificates rather than just the longer-term degree.

— Online and hybrid models: Eight colleges began offering new online or hybrid classes. In many cases, the flexible hours of online and hybrid courses were intended to enable working students to complete programs based on their own schedules. Sinclair Community College, for example, introduced hybrid delivery for a CAM certification, which greatly reduced the number of hours that students need to spend on campus. This was part of an overall approach for shifting programs to a competency-based model built around open lab time for students to complete their work at their own pace coupled with online coursework to allow greater flexibility. To manage students in an online environment, the college developed a real-time dashboard that tracks student in-person attendance, use of online materials, and course progress. A coach intrusively intervenes via phone or email if a student is struggling or lagging.

— Accelerated models: Pursuing approaches designed to help students complete programs faster was thematic throughout the consortium. Columbus State Community College, for example, implemented what staff described as an "accelerated response" model, under which students could enroll in multiple 5-week modules to complete coursework at an accelerated pace. Courses include welding for non-welders, CNC operator, and maintenance/operator. Similarly, Cincinnati State Community and Technical College offered an accelerated welding program that consists of three courses that can be completed in less than 15 weeks.

— Competency-Based Education models: Four of the colleges moved toward integrating competency-based curricula under the grant. Sinclair was the most prominent example, described in part below. At Sinclair, students working toward any certificate in the industrial maintenance program (all non-credit programs) could accelerate through parts of their coursework based on demonstration of competency or scores in pre-assessment. Sinclair also offers "rolling registration" to allow students to enroll in courses at multiple points throughout the semester and year. And, courses are

Noteworthy Practice: Competency-Based Education at Sinclair Community College

By converting programs to competency-based education, Sinclair Community College enabled students working toward any certificate in the industrial maintenance program (all non-credit programs) to accelerate through parts of their coursework based on demonstration of competency or scores in pre-assessment. On the credit side, a competency-based model was integrated into the first level of a CAM certification, as well. In total, the college developed nine CBE courses in its targeted programs and developed a new flexible lab space that enables students to complete lab work in their own flexible timeframes. Additionally, programs are offered with rolling admissions and every-two-weeks start dates, which offers greater flexibility to students. The college developed a real-time dashboard that tracks student in-person attendance, use of online materials, and course progress. A coach intrusively intervenes via phone or email if a student is struggling or lagging. Preliminary results provided by the college indicate that students are finishing courses about 30 percent faster and at a 10 percent higher rate than traditional manufacturing courses. Some courses are finished as much as 40 percent faster than the traditional delivery model.

characterized by open lab coupled with hybrid course delivery. According to the college staff, their internal data indicates that participants completed CBE courses with an 84% success rate, and 30% faster than students in companion, non-CBE courses. Some courses are finished as much as 40 percent faster than the traditional delivery model. A descriptive analysis (meaning not statistically valid due to limitations in the comparison group for CBE programs) of CBE programs in OTN supports this. As presented in the Impact Evaluation section, on average, CBE program participants completed 7.9 grant affected credit hours vs. an average of 4.4 credit hours among all participants.

— Apprenticeships: Several colleges worked to expand apprenticeship programming. Concurrently with the OTN grant, the Ohio Department of Job and Family Services (ODJFS), which houses the state's apprenticeship office, received a multi-year grant from the US Department of Labor to expand apprenticeships via community colleges in Ohio. Owens and Rhodes are two of the state's most prominent colleges that facilitate apprenticeships in partnership with local industry. Rhodes, for example, emphasized the expansion and deepening of industry sector partnerships under the grant. The college houses and works closely with a group called the West Central Ohio Manufacturers Coalition, which helps to facilitate many employer relationships. Efforts included an expansion of apprenticeship and pre-apprenticeship programs. For example, new apprenticeships are being developed in wastewater management and process operations. A new food science curriculum, which includes an apprenticeship option, was developed under the grant in partnership with many regional companies. And, a partnership with a Community Based Correctional Facility expanded to include a pre-apprenticeship program focused on women exiting the judicial system. Finally, Rhodes State's project manager partnered with colleges throughout the state to provide technical assistance around the development of apprenticeships. Sinclair, Cuyahoga Community College, and Lorain County Community College also became apprenticeship sponsors under the ODJFS grant.

Noteworthy Practice: Apprenticeship Pathways at Rhodes State College

The development of apprenticeship pathways received major emphasis at Rhodes State College under the Ohio TechNet grant, especially in manufacturing fields where the college partnered with dozens of companies including include Grob Systems, Ford Motor Company, Production Products, Inc., Progressive Stamping, Inc., Dana Holdings, Koneta Rubber, DTR, Coldwater Machine, Whirlpool, and Miller Precision. In part, the college used grant funds to strengthen pre-apprenticeship programs with special focus on women and minority candidates. A new apprenticeship pathway in food science was developed under the grant; and new programs in wastewater management and process operations are in development. Rhodes State College was recently the first Ohio community college to be approved by the Ohio Department of Job and Family Service's Ohio State Apprenticeship Council as a U.S. Department of Labor (DOL) Registered Apprenticeship Sponsor. Due to Rhodes State College's leadership in the development of apprenticeship programs, the Ohio TechNet project manager at RSC was designated to assist other Ohio TechNet schools seeking to expand Registered Apprenticeships. Through partnership with the Ohio Department of Job and Family Services, she worked with several OTN schools in the development and expansion of manufacturing apprenticeship programs.

Innovative uses of technology include:

- — Equipment purchases: A common use of grant funds (nine percent of the overall budget) was for the purchase of new manufacturing equipment for use in training. Throughout the consortium colleges purchased welding booths and trainers, CNC machines, mills, lathes, PLC, integrated automated systems, 3-D printers, design software, robotic arms, and various other types of equipment for use in training. At least five colleges, for example, purchased virtual welders, which are computer-based training systems that allow students to practice welding techniques in a simulated environment. Additionally, ten percent of budget was used to purchase supplies.
- — Space renovations: Another common use of funds (four percent of the overall budget) was to renovate or improve training space. For example, Cincinnati State used grant funds to build a new welding lab on its main campus. And, Stark State completely renovated its machining lab into a modern state-of-the art training facility, which has resulted in renewed interest and partnerships from area companies and high schools.

Noteworthy Practice: Space Renovation at Lakeland Community College

Lakeland Community College is in the midst of major renovations of their Engineering Building, which houses the Welding programs included in the Ohio TechNet initiative. With grant funds, the college renovated and expanded its welding space adding new welding training stations along with a new ventilation system. The college is leveraging the momentum from the Ohio TechNet grant's renovation of welding lab facilities and equipment purchases to pursue additional funding for renovations of additional welding space and a large-scale renovation of the entire engineering facility. A $725,000 capital improvement grant matched by $400,000 from the college's budget, and another $400,000 equipment grant will fund further program improvements building on the Ohio TechNet grant. And, bond initiative that could total as much as $4,000,000 is in the planning stages to renovate the entire engineering program building.

<u>Employer Engagement in Transforming Instructional Design and Delivery</u>

Employers were a principal partner working with colleges to improve programs, as well as clients or end-users of the new and improved programs and pathways developed in the grant. Colleges worked to expand and improve their employer relationships, which meant working to find expanded roles for employers and to bring new employers into the fold. When asked to describe the principal motivations of their employer engagement efforts, Ohio TechNet colleges were consistent in identifying the intent to:

- improve disconnects between college curricula and industry skill needs,
- draw on employer advisement and donations to increase uses of equipment and other instructional technologies in their programs,
- fully utilize best practices such as learn-and-earn, apprenticeships, or flexible program designs for incumbent workers in instructional models, and
- encourage hiring.

To accomplish these goals, OTN colleges partnered with industry associations and coalitions, in addition to local and national businesses. Ohio TechNet launched in 2014 with the support of 47 employers as articulated in letters of support that accompanied the grant application. By the end of the project, the colleges had engaged more than 500 employers in a meaningful role (see descriptions in the section below); in addition, the consortium launched a new partnership with the Ohio Manufacturers' Association which reaches a 1400+ membership base. Colleges used varying strategies for business partner cultivation and relationship development; the evaluation conducted an inquiry to learn more about the roles of employers and the efforts to engage them. Interviews unearthed a variety of practices and many commonalities in how employer engagement was approached. In some cases, there was very limited bandwidth or staff working to cultivate employer relationships; in other cases, employers were engaged with the assistance of third-party organizations such as employer associations; and in other cases, colleges dedicated significant staff time and effort to initiating and deepening employer connections.

Emerging Opportunity: Learn and Earn Programs

The Ohio TechNet consortium launched in 2014 citing that approximately 50 businesses had been engaged in the development of the project. Over the course of the grant performance period, the number grew to more than 500 businesses, all of which were seeking to strengthen their talent pipelines. This, coupled with the fact that approximately 2/3 of grant participants were employed while attending school, indicates that there is strong interest from businesses and students to strengthen the integration of work and school. Many schools recognize this opportunity and have begun to expand programs such as internships, co-ops, and apprenticeships. For example, using the TRAIN (Training & Recruitment Accelerated Innovation Network) OH model that blends schools and work into a 21st century earn and learn hybrid activity where companies and educators integrate efforts in both space and time, Lorain County Community College's Micro Electro-Mechanical Systems program enables students to work as many as 1900 hours in a paid internship that is integrated into the associate degree program. The paid internship plus financial aid means students can graduate debt free and with extensive work experience in the field.

How each Ohio TechNet college utilizes and builds their partnerships with employers was derived from their local contexts. These partnerships allowed colleges to align curricula and instructional delivery to the needs of employers; strengthen apprenticeship, co-op, and internship programs; and provide training for incumbent workers. This section documents elements of employer engagement.

— Curriculum Advisement: All of the colleges had advisory councils for their Ohio TechNet programs. These councils were most commonly convened twice a year and included five to seven business partners, although some included as many as 40. The councils were formed to provide input on instruction and curriculum content but were often actively engaged with the college in other ways, participating in a number of activities including: sharing data on openings, hosting plant tours, speaking at college-hosted events, donating equipment, conducting on-campus interviews of students, and hiring completers. In addition to advisory councils, OTN partners also utilized employers in other ways to review their curricula to ensure alignment with the needs of businesses, such as seeking feedback after training.

- Incumbent Worker Referrals: Nearly all of the OTN partners indicated working directly with local businesses to provide training for incumbent workers. Several of the partner colleges trained predominantly incumbent workers in their programs. For example, Stark worked closely with several businesses, including Ariel Corporation, to identify the coursework needed to skill-up employees and help re-think career pathways for employees that had completed training.
- Regional Needs Assessments: Other programs work closely with both companies and industry associations to identify gaps in the regional labor market. For example, at Rhodes State, the staff conducted a comprehensive needs assessment survey and received approximately 65 responses from area businesses. Curricula was adjusted based on needs identified through the survey. Rhodes State then works with partner companies to customize the training. This customization includes offering the training at the employer's facility or using the employer's proprietary materials in the training.
- Apprenticeships, Co-ops, and Internships: Earn and learn strategies were a key driver of alignment between the OTN colleges and their local businesses. Many of the colleges offered formalized apprenticeship, co-op, or internship programs established as parts of their programs. Cincinnati State, for example, requires a co-op experience for all students taking degree programs. The college has a formal evaluation process at the end of each co-op and uses this information to adjust the experiences based on the employer's feedback. Colleges that did not pursue these types of arrangements either were facilitating these connections informally or recognized the need for these sorts of opportunities and were working to establish them. There was strong interest among consortium colleges around expanding and establishing new earn and learn opportunities moving forward after the grant period.

- Program Donations: Many employer partners made direct or in-kind donations to many of the Ohio TechNet colleges. Direct resources often came in the form of equipment or material donations. For example, employer partner Haas Automation donated multiple pieces of machinery to Owens Community College's lab, including programmable logic controllers and computer numerical control machines. And, Lakeland's partners worked with the college to supply welding metal and materials at a steeply discounted price. Multiple partners also donated scrap metal to Owens for their welding program. In another example, Stark State received donated CNC machines and 3-D printers from employer partners such as Timken and Ariel Corporation. In-kind resources were often donations of time to the college or program. For example, employer partner Detroit Diesel worked closely with Zane State to set up tours of their facility and let students try their auto-cad software. The company's local branch was highlighted among branches nation-wide as an example for how to effectively partner with a community college. And, LCCC held a STEM forum, which helped build awareness of their OTN programs, which was key-noted by their employer partner from Ford.

Processes for Business Partnership Development

Processes for building employer partnerships was similar across colleges - Lead Generation, Needs Assessment, Solution Development – although local contexts determined much of how colleges went about this work. In some cases, colleges worked through industry associations

such as the Mahoning Valley Manufacturers Coalition, Partners for a Competitive Workforce (Cincinnati area), and the West Central Ohio Manufacturers Coalition or staffing agencies. Challenges including staff capacity to conduct outreach and information management across college personnel and departments made employer engagement complex, especially for colleges that did not have dedicated staff or an industry association for support.

- Lead Generation: For college-initiated partnerships, colleges identified potential business partners in a number of ways. The most common method of lead identification was relying on the pre-existing relationships faculty, staff, and administrators had with the business community. For example, Columbus State noted that leveraging these types of existing relationships among their welding faculty was key to deepening existing employer partnerships and tapping into networks to develop new ones. Columbus State also relied on the strong interconnections within the college for employer referrals, as well as the strength of the networks with other, non-employer partners in the community. The college was able to use the networks of community partners such as the food bank, the local Urban League, and economic development organizations to increase their number of business partnerships. The second most common method of identifying potential partners was based on extrapolations of labor market analyses. LCCC regularly provided labor market data to the consortium colleges. Over half of the colleges in the consortium indicated the use labor market information, from local job openings to detailed data from services like EMSI or Burning Glass to unearth partners based on available positions, number of employees in the field, and anticipated growth. For example, Stark State looks at multiple sources of labor market information, including newspaper classified ads, to identify employer partners. The staff looked at entry-level positions and middle-skilled openings. The college used this information to target employers for outreach.
- Needs Assessment: After employer partners were identified, the colleges typically worked to set up an initial meeting, which often included a needs assessment. Who attends that meeting often depended on the structure of the program, who made the referral, and the position of the employer representative (i.e. CEO, Operations Manager, HR manager, front-line supervisor, etc.). The needs assessment process was discussion-based (as opposed to tool-based) and was used to identify ways the college could plug into the company's workforce lifecycle. For example, Tri-C sends a client engagement manager to the initial meeting. The manager would tour the facility and ask the employer about their pain points. Tri-C offered a mobile classroom, which could be taken out to employers to demonstrate their training capabilities even before the employer agreed to partner. In one circumstance, one of Stark State's employer partners needed to fill additional positions. A representative from Stark State met with them to discuss their needs and used case studies from other companies who had utilized Stark's program to convince them to grow their own talent and backfill the front line, noting their starting wages were too low to attract outside talent.
- Solution Development: College staff took the information gleaned from the needs assessment and worked within their colleges to create solutions. Colleges determined whether or not the best option was through a credit or non-credit-bearing program. For example, non-credit information from the needs assessment goes to the appropriate staff (subject matter expert or instructor, usually) and they put together a curriculum for a company and vet it with them. Credit information was used to provide

small tweaks to existing programs (program start, schedule, equipment used, etc.), as appropriate.

Employer Engagement Challenges

The OTN colleges faced similar successes and challenges in building and sustaining business partnerships, despite differences in program structure and local context. Several challenges were cited by project managers.

- Time: A lack of time to do outreach, and time-strapped businesses, were the biggest challenges named by all of the colleges in the consortium. Almost every college reported that it was a challenge to get employers to commit to the amount of time required to participate in meetings, councils, and events. To mitigate this challenge, colleges often scheduled meetings with employers several months in advance. Most colleges reported that finding the staff time for engagement was a challenge. Columbus State noted that they could justify a full-time employee dedicated to engagement and outreach; although many colleges assigned employer engagement to staff, instructors, or deans as an embedded duty among others.
- Reaching the Correct Person: Many of the colleges noted that establishing lines of communication with employers was a challenge. When reaching out to a company, many colleges reported that getting into contact with the person who made decisions about training could be a challenge. One college stated "Reaching the right person at the employer can be a challenge depending on the desired outcome of the engagement. Often times the relationships are forged at the supervisory level and do not reach HR or executive decision makers". Colleges also reported that referral structures within the college could cause frustration for employers. Many colleges had no designated first line of contact. Another college stated that some employers could have trouble getting through the college's bureaucracy if they called the wrong person initially.
- Location: While not a consistent challenge for every college, both rural and urban colleges reported their location as a challenge. For example, Sinclair services a multi-county region, but some employers from far reaching area were sometimes hesitant to travel. And, some rural campuses noted a relative lack of employer density and numbers as a challenge.

Grant Strategy: Expand best practices that redesign student intake, success, and placement.

Another means through which colleges worked to keep pace with the changing manufacturing economy was to improve supportive services enabling students to enroll, stay enrolled, and complete programs leading to manufacturing employment. All colleges hired or assigned a position that was called a Navigator to recruit, academically advise, and career coach students in grant affected programs. These individuals became a focal point for how colleges interacted with students with broad responsibilities for recruitment, coaching, advisement, and employment connections. Additionally, colleges focused heavily on leveraging relationships with local partners to support students including workforce agencies and community-based organizations. Over 50 external partners were engaged to support students in OTN programs.

A review was conducted of how colleges used grant resources to support student intake, success, and job placement.

— Recruitment: The responsibility for recruitment was handled differently from college to college, although many colleges relied on Navigators plus existing college recruitment methods to drive grant enrollments. Navigators, project coordinators, and academic advisors were the most common sources of recruitment. Most of the schools worked to deepen partnerships with external organizations such as workforce agencies or community-based organizations to help with recruitment efforts. For example, Rhodes State expanded a partnership with a local correctional facility to provide pre-apprenticeship training for individuals exiting the criminal justice system. Overall, grant participation greatly exceeded its objectives (2,248 enrolled versus a targeted enrollment of 1,801), so recruitment processes were not targeted for deeper inquiry. One noteworthy element relevant throughout the project's duration was that the share of incumbent worker participants was high (70 percent). This had ripple effects for grant management particularly in efforts to achieve grant-directed employment outcomes, which relied on higher numbers of unemployed participants. One notable recruitment strategy involved partnerships with staffing agencies. ZSC and LCCC explored partnerships with local staffing agencies to connect with candidates in need of training in order to obtain entry-level jobs. The strategy involved having the agency refer candidates to the college for training and then the trained talent was placed in employment via the staffing agency.
— Screening/ Intake: Colleges relied on existing program assessment and intake methods; however, several colleges had undertaken college-wide initiatives to reform early-stage advisement and program declaration processes. For example, LCCC is adopting the tenets of Guided Pathways, through which they require students to work with advisors to determine their academic route and program declaration upon enrollment. Throughout the consortium, advising processes tended to be informal where Navigators communicated with students to provide guidance based on student interests and aptitudes. Cincinnati State leveraged a student-centered approach to orientation and onboarding called Pathway to Employment Center (PTEC) that offered academic advising, career assessment, planning and placement services; it also coordinated cohort-based workforce development programming in support of students seeking industry-recognize credentials.
— Student support services: The Navigator role was the primary intervention in this grant focused on driving retention and completion rates. Each of the colleges brought on or re-assigned a Navigator to work on the grant. The Navigators were responsible for advising students, helping them stay enrolled and move through their programs, and connecting them to work. Navigators described their daily work as meeting with students to develop academic or career plans, checking in with and monitoring students to identify threats to retention and connecting them to support services within the college – tutoring services, for example. At the end of the grant, the majority of the Navigator roles were not sustained with competing budget priorities cited as the primary reason, although there were two that were retained in similar roles with expanded programmatic responsibilities. At the end of the grant, a small number of colleges were re-assessing but had not yet made decisions about retaining Navigators; the remaining colleges re-assigned navigator functions to other parts of the college such as student advisement or career services.

Key Challenge: Sustaining Student Support Services

As a requirement of grant participation, each college hired a Student Navigator to provide recruitment, advising, coaching, and general student engagement with a belief that these activities would support increased completion rates. At the conclusion of the grant, Project Managers and Student Navigators resoundingly expressed that the navigator role positively affected enrollments and completions. There were many examples of contributions made by Navigators that would not have happened if not for grant funding to support the role. For example, Stark State College's Navigator organized a well-attended event for high school counselors and teachers to tour and learn about the upgraded manufacturing training lab at the college. However, the majority of colleges chose not to sustain the Navigator role following the conclusion of the grant, although two colleges re-positioned the Navigator to continue the role with broader responsibilities.

— Transition to work: There was much activity intended to promote employment among participants. All colleges indicated they were working with employer partners to enhance curricula that deliver high-demand skills as well as to connect employers to students that may have the skills needed for their organization. At some colleges, internships were noted as popular with employer partners and believed to lead to jobs for students upon graduation, although there was no cross-cutting strategy in the grant focused on internships, and thus, no deeper dive in the evaluation. Many schools worked to expand or strengthen their 'earn and learn' opportunities to create on-ramps for students into higher paying employment.

— Job retention: Job retention for three quarters (two quarters after the quarter of completion and grant exit) was one of the TAACCCT outcomes. There were no job retention services implemented by colleges through this grant, nor were such services identified at any of the colleges in the array of services available to students. The theory among staff at most colleges was that strong training that is aligned with employer needs leads to job retention.

Local partnerships

Project managers were asked to describe any collaboration occurring within their college or with local partners in support of their OTN program(s) and to describe how internal college, non-OTN resources or programs/initiatives were leveraged to address OTN student needs.

Noteworthy Practice: Student Success-Focused Design at Lorain County Community College

Lorain County Community College (LCCC) has embraced an institutional philosophy focused on supporting student persistence and completion, and The Ohio TechNet grant was used to further the development of programs and services in support of these goals. For example, LCCC is adopting the tenets of Guided Pathways, through which they require students to work with advisors to determine their academic route and program declaration upon enrollment. They integrated Navigators who communicated with students to provide guidance based on student interests and aptitudes. Additionally, the college developed and will sustain what are called manufacturing RAMP programs, which are early-stage courses that operate within the college's meta-major structure and allow students to complete early basic program content minimizing the risk of losing ground if they change majors. Recently, LCCC was named the top community college in the country for Excellence in Student Success by the American Association of Community Colleges (AACC).

— Leveraging money from other grants. Several colleges leveraged money from separate grants and other sources in support of OTN programs. In total, $2.85 million was leveraged for this grant. For example, Zane State reported receiving $33,000 in donations of welding materials from corporate partner Bi Con. LCCC used separate funds to purchase a new mill and other industrial maintenance equipment for use in its Right Skills Now program. Stark State leveraged money under a different grant to purchase 3-D printers for its machining lab. And Tri-C purchased a robotic welder and is also building a new Fab Lab with funds that are separate from the OTN grant. Perhaps the largest example of this is Lakeland's decision to pursue a multi-million-dollar bond initiative to renovate its entire engineering building, which builds on the momentum of the welding space renovation and expansion achieved under OTN.

— Cross-departmental collaboration. Colleges crossed departmental lines to implement their OTN programs drawing on resources from other areas of the college. Rhodes State, for example, created a steering committee that crossed departments and included members of student services and administrative staff. Sinclair worked closely with the college's registration department to successfully implement rolling registrations for their newly implemented competency-based education programs, and with its research and reporting department to create student performance reports under the grant. Several colleges use their career centers or navigators/student success coaches to recruit and counsel students and align internal resources. Cincinnati State employed a model called the Pathway to Employment Center, which served multiple programs as a coordinating entity and one-stop counseling and advisement resource for students. The Center provides outreach, recruiting, career assessment and advising, tutoring, and employment-related services. Zane State developed a case management system that allowed project staff to track and advise students even as they enrolled in courses across departments. Similarly, Sinclair allowed a student eligible to use TAA funds to complete a custom Associate of Technical Studies degree containing mostly grant-affected courses with the combined efforts of the academic Science, Engineering, and Math division & workforce development division. Following completion, the student secured employment as a Facilities Maintenance Technician, with more than a $2/hr raise from his previous position.

— Partnerships with local workforce development entities and community-based organizations. Colleges worked to expand or enhance workforce agency and community-based organization partnerships in support of OTN programs. For example, Stark worked to better align its grant program and apprenticeship opportunities with local Veterans services. Columbus State launched a formal partnership with Ohio Association of Food Banks (OAFB); an initial orientation session resulted in 8 students signing up for a Maintenance Awareness program. (OAFB paid costs for these students).

The Ohio TechNet Grant Drove Collaboration Among Many Disparate Organizations and Initiatives Serving the Manufacturing Industry in the State and Functioned as a Front Door for In-State and Out-of-State Initiatives Allowing Easy Access to Ohio Colleges.

In addition to working to keep pace with the changing needs of employers, the grant operationalized an approach for connecting networks of collaborators throughout the state and nation. One strategy of the grant was dedicated to working to improve collaborations.

Grant Strategy: Establish an infrastructure for collaboration among colleges and partners to supports efforts to adopt and spread innovations in manufacturing education and training.

The OTN consortium was described by one national collaborator as providing a "front door" for national and state entities to engage with Ohio colleges and their partners. Collaboration among colleges and external partners was a hallmark of this initiative. Ohio TechNet served as an entry point for state and national organizations to partner with Ohio community colleges to address workforce challenges. Project leadership was active in cultivating external relationships with partnering organizations resulting in connections to additional resources for colleges that complemented the OTN grant. Several themes and challenges emerged in this strategy:

— New infrastructure to manage collaborations: Ohio TechNet built an infrastructure for collaborative projects where limited collaborative opportunities existed previously. The initiative established infrastructures for consortium leadership, management, communication, budget management, and reporting. State agencies viewed OTN as an accessible implementation arm for state initiatives, and state agency staff regularly attended OTN meetings and conference calls as a means of participation. Several state agencies leveraged OTN to implement statewide initiatives. For example, the Ohio Department of Higher Education (ODHE) leveraged OTN funding to develop and distribute a PLA toolkit and website, which functions as a PLA assessment tool, that helps guide schools and students in the development of PLA policies and opportunities. The Ohio Department of Job and Family Services (ODJFS) partnered with OTN to support implementation of a $2M apprenticeship initiative. The Ohio Department of Higher Education, LIFT, and Governor's Office of Workforce Transformation launched the Ohio Manufacturers Career Council and partnered with OTN to staff the group.
— New business partnerships: Ohio TechNet has worked to strengthen partnerships between businesses and educational institutions. The Ohio Manufacturers' Association (OMA), which identifies workforce development as a key issue among its members, developed an Education and Skills Committee coordinated by OTN staff. The committee launched a "manufacturing careers image" campaign and statewide approach to develop sector strategies in partnership with the Lightweight Innovations for Tomorrow (LIFT) institute and the Governor's Office of Workforce Transformation (OWT).

— Common elements across colleges: Ohio TechNet colleges took varied approaches for using grant funds to improve their programs; nonetheless, the grant worked with colleges to develop common programming in certain topics. Nearly all OTN colleges were recognized on The Manufacturing Institute's M List. The M-List recognizes high schools, community colleges, technical schools, and universities that are teaching manufacturing students to industry standards. Specifically, these schools offer students the opportunity to earn NAM-Endorsed Manufacturing Skills Certifications as a standard part of their manufacturing education programs. And, Cuyahoga Community College received additional funding from OTN to help the consortium with expansion of veteran outreach and development of a Safety Certificate program that is available throughout the network and OTN provided funding to Rhodes State to assist the lead team in expansion of on-the-job training initiatives based on their extensive experience developing apprenticeship programs.

Emerging Opportunity: Sector Partnerships

The Ohio TechNet consortium has been working to deepen its relationship with the Ohio Manufacturers' Association. The Ohio Manufacturers' Association (OMA) adopted workforce development as a strategic focus area in 2015 with special emphasis on improving the image of manufacturing working environments among emerging and potential workers and enhancing connectivity among employers and educational institutions to drive new training partnerships. Ohio TechNet provided monetary support for an image campaign that involved hiring a consultant to develop materials and an outreach campaign to deploy the materials with an end goal of influencing students and workers to consider manufacturing careers. A 30-day social media campaign garnered 365 new followers, 1,184 new site visitors, 1,691 social link clicks, 58,000 total engagements, and a 6.6% engagement rate. The image campaign likely would not have happened without Ohio TechNet resources. Additionally, OMA is working to enhance sector partnerships that bring together employers and educational institutions. The sector strategy work was supported by an organization called LIFT, which contributed resources to research and document education and training assets in the state. LIFT also supported OMA to hold a series of regional meetings throughout the state inviting manufacturing employers and educational institutions to participate in discussions about workforce challenges and solutions. A culminating event, called a Workforce Summit, was held in Columbus that was attended by nearly 500 people and key-noted by Governor John Kasich. An agenda for improving sector partnerships throughout the state is emerging as a result of the series. Ohio TechNet encouraged its member schools to participate in these convenings and provided staff support to carry them out. These sector partnership development activities are continuing to develop led by OMA.

— Connections to national initiatives. The National Network of Manufacturing Innovation institutes, which were re-branded during the grant performance period as Manufacturing USA, bring together industry, academia, and government partners to nurture manufacturing innovation and accelerate commercialization. OTN connected with three of the institutes –LIFT, America Makes, and NextFlex. LIFT worked through OTN on an initiative to establish a Manufacturing Readiness curriculum at community colleges in Ohio, stating in an interview that OTN was an accessible network to leverage to spread

their initiative. Additionally, LIFT provided funding to OTN to staff the Ohio Manufacturers' Careers Council. Another grant-funded initiative at LCCC called Speed-to-Market Accelerator led to a relationship with NextFlex to develop earn-and-learn opportunities in partnership with companies, which was piloted in the micro-electronics field. And, America Makes invited OTN leadership to attend planning sessions as it worked to develop its forthcoming workforce development agenda.

Emerging Opportunities: National Funders

Throughout the grant, there was a favorable opinion that Ohio TechNet provided an easy "front door" for state and national initiatives seeking to access and leverage Ohio's community colleges. For example, Manufacturing USA, which is a network of regional institutes, each with a specialized technology focus, that promotes workforce development efforts in manufacturing. Two regional institutes engaged with Ohio TechNet: Lightweight Innovations for Tomorrow (LIFT) located in Detroit, and NextFlex located in San Jose. LIFT partnered with Ohio TechNet to spread an employability skills and Manufacturing Foundations curriculum to several colleges with an intent to demonstrate success leading to further expansion. **LIFT's project director stated that they likely would not have funded this initiative in Ohio if Ohio TechNet had not provided a convenient entry-point and communication infrastructure for reaching many colleges at once.** Additionally, NextFlex has partnered with Ohio TechNet lead college LCCC to support a learn and earn model called TRAIN OH in LCCC's micro-electronics program. Ohio TechNet provided funding to launch TRAIN OH and has provided a platform for NextFlex to promote the TRAIN OH model throughout the consortium. The Ohio TechNet infrastructure provides an easily accessible project infrastructure for national initiatives and funders looking to advance workforce development.

— Data infrastructure that integrates primary student data with state administrative data: Although developing a data infrastructure for performance management and evaluation was challenging, the end result is receiving interest from funders as an element for possible sustainability after the grant. The data infrastructure included support and guidance for the colleges to assemble new data on manufacturing programs and enabled deeper analysis of program effectiveness that was not previously possible. In particular, the system captures data on non-credit students, and it captures the acquisition of industry-recognized certifications – two previously uncollected data elements. These new data sources were linked to state administrative education and employment records, producing detailed, comprehensive participant records without the response rate issues typically associated with surveys. Three challenges hindered the effort to build a collaborative data system that was responsive to evaluation and project management needs: (1) state administrative data systems are lagged. Specifically, the state's Higher Education Information system, which holds student records, and Unemployment Insurance Wage records, which contains employment and earnings data, are lagged approximately three quarters. While these lags are necessary for administrative processing and cleaning of data, they made real-time project management challenging. (2) The development of data sharing agreements to assign legal responsibility for the proper protection and uses of data was disproportionately time consuming within the grant period. According to the state

managers of these administrative data sources, such agreements can take routinely take six to twelve months to process, which is significant in a time-limited grant program. Agreements governed sharing data among 14 organizations. The development of agreements was especially challenging because few OTN colleges have a legal counsel to draft or review data sharing agreements, and the state's Attorney General's office became involved in approving the agreements; few colleges had policies governing data sharing; and policies governing the use of Institutional Review Boards were inconsistent across colleges (e.g. most did not have an IRB, one required a full blown IRB application process, and one provided on-the-spot exemptions following a verbal explanation of the project). (3) The lead college assumed project management of the data plan and data sharing agreements with support from third-party evaluators. Lead college staff had limited experience managing large-scale data plans or data sharing agreements, and a learning curve slowed progress. All of these challenges were overcome during the grant leading to a functional data system for evaluation and project management.

Project Sustainability and Lasting Elements

The following table provides detailed descriptions of elements from each college's grant implementation that will be sustained beyond the grant period. The three strategies of the grant are identified for each college.

Table 3: Lasting Elements

College	Lasting Elements
Cincinnati State Technical and Community College	— Collaborations: An expanded relationship was developed with regional workforce intermediary Partners for a Competitive Workforce (PCW) focused on expanded manufacturing awareness and pre-apprenticeship training. — Instructional Transformations: Renovated and expanded a welding lab. A stackable MIG certificate was added to the welding curriculum. — Student Intake, Success, and Career Placement: A new college-wide career services center drawing in lessons from OTN is being added and incorporating elements of PTEC where previously there was little or no unifying strategy in this area. The navigator responsibilities will transition to the new career services center. Strengthened co-op and internship program offerings for non-credit students.
Columbus State Community College	— Collaborations: Program improvements supported the hallmark Modern Manufacturing Work Study program, which is a five-semester learn-and-earn program first developed in partnership with Honda. Partnerships with community-based organizations deepened with a priority on the criminal justice re-entry population. — Instructional Transformation: Upgraded facilities, equipment, and curriculum in two programs - Welding and Integrated Systems Technology. The welding program features a new system that allows local companies to send experienced welders to record their welding techniques via motion capture technologies. Welding program became an Accredited Testing Facility of the American Welding Society. The Integrated Systems Technology Program purchased upgraded

	equipment and developed and re-organized courses into a mastery-based, open-lab format. — Student Intake, Success, and Career Placement: The Integrated Systems Technology program's mastery-based, open lab concept, and the Modern Manufacturing Work Study program are cited as two lasting innovations that promote student success.
Cuyahoga Community College	— Collaborations: An expanded employer list is the most prominent lasting collaboration emerging from the grant. — Instructional Transformations: The welding program was greatly expanding growing from a few classes to a one-year certificate. An industrial art project was incorporated into the program as a form of project-based learning. An industrial automation program was launched with stacked credentials and new equipment. Industry credentials are embedded throughout. — Student Intake, Success, and Career Placement: Stacked credentials that incorporate industry credentials are cited as the chief lasting contribution to student success.
Eastern Gateway Community College	— Collaborations: New articulation agreements have been developed with Mahoning Valley Career Center, Choffin Career Center, and Columbiana Career Center allowing high school students to earn dual credit amounting to up to one year of college credit. AWS and NIMS certifications are offered at the career centers. The college has partnered with the Mahoning Valley Manufacturers Coalition to offer a welding apprenticeship program. — Instructional Transformations: Equipment upgrades have been the primary investment. — Student Intake, Success, and Career Placement: Strengthened dual enrollment on-ramps are the chief lasting contribution to student success.
Lakeland Community College	— Collaborations: The college achieved growth and more energized engagement of companies on the welding program's employer advisory council. Deeper engagement in curriculum development, equipment donations, and a new scrap metal purchasing program that produces a large savings for the college. The college is leveraging the momentum from the OTN grant's renovation of welding lab facilities and equipment purchases to pursue additional funding for renovations of additional welding space and a large-scale renovation of the entire engineering facility. A $725,000 capital improvement grant matched by $400,000 from the college's budget, and another $400,000 equipment grant and funding further program improvements building on the Ohio TechNet grant. And, a multi-million bond initiative is in the planning stages to renovate the entire engineering program building. — Instructional Transformation: The college renovated and expanded its welding lab and purchased new welding training stations. The welding program was updated to include a series of modularized, stackable certificates. American Welding Society certifications have been

	embedded. The college transitioned its welding degree from an Associate of Technical Studies to an Associate of Applied Science, which enables students to articulate or transfer into a four-year program. An articulation agreement was developed with Penn College (PA). Additionally, the new curriculum was infused with project-based learning, including several community-based projects. — Student Intake, Success, and Career Placement: Improved employer connections are viewed as the lasting innovation that will promote student success and connections to jobs.
Lorain County Community College	— Collaborations: The college has strengthened a partnership with Cuyahoga Community College to enhance Occupational and Industrial Safety programming. In particular, governed by a signed memorandum of understanding, the colleges are sharing equipment, instructors, and lab space in the delivery of programming. Additionally, these two colleges are jointly running an apprenticeship program in advanced manufacturing in CNC training in Medina County. — Instructional Transformations: A learn-and-earn model that received OTN grant support in the college's Micro-Electronics Manufacturing Systems (MEMS) program, called TRAIN OH, will be sustained. Additionally, the MEMS program has been extended into an applied bachelor degree program. The college developed and will sustain what are called manufacturing RAMP programs, which are early-stage courses that operate within the college's meta-major structure and allow students to complete early basic program content minimizing the risk of losing ground if they change majors. Finally, a non-destructive testing program was developed, and has recently received additional funding from the National Science Foundation. — Student Intake, Success, and Career Placement: The TRAIN OH learn-and-earn model allows students to complete the program debt free, employed, and with excellent skills for career advancement. A model for intrusive advising and wrap-around support has been adopted college-wide.
Owens Community College	— Collaborations: The college improved its systems for gathering information about which industry credentials students have earned. And, a re-invigorated effort to promote internships has emerged. — Instructional Transformation: The college received approval to become a certified testing facility for the American Welding Society. Additionally, the college focused on invigorating its Prior Learning Assessment tools and services. New equipment was purchased for programs. — Student Intake, Success, and Career Placement: The Student Navigator role is being considered for sustained funding.
Rhodes State College	— Collaborations: The college houses and works closely with a group called the West Central Ohio Manufacturers Coalition, which helps to facilitate many employer relationships. Efforts included a focus on the integration of industry-recognized credentials into programs, and

	expansion of apprenticeship and pre-apprenticeship programs. New apprenticeships are being developed in wastewater management and process operations. A new food science curriculum, which includes an apprenticeship option, was developed under the grant in partnership with many regional companies. And, a partnership with a local community-based correctional facility expanded to include a pre-apprenticeship program focused on women exiting the judicial system. — Instructional Transformations: A new one-semester food sciences certificate program was created; the development of a longer-term certificate and two-year program that articulates with Wright State University are still in development. Courses in the food science program have been modularized so they can be offered in one credit increments. Additionally, the college's welding program was converted into a competency-based program with online and open-lab instruction. Many new industry credentials have been embedded within noncredit programs that articulate into credit programs including FANUC, MSSC CPT, ServSafe, and HACCP. — Student Intake, Success, and Career Placement: The college placed an emphasis on early alerts, intrusive advising, and first-year experience coursework.
Sinclair Community College	— Collaborations: The college focused on aligning resources from its local OhioMeansJobs (OMJ) partner to promote improved access and funding for individuals to pursue entry and intermediate level manufacturing jobs. — Instructional Transformations: The college developed nine CBE courses in its targeted programs and developed a new flexible lab space that enables students to complete lab work in their own flexible timeframes. Additionally, programs are offered with rolling admissions and every-two-weeks start dates, which offers greater flexibility to students. — Student Intake, Success, and Career Placement: The colleges refined an intrusive coaching model to accommodate CBE course delivery and the flexible lab. As a result of these curriculum changes, students were using the physical space and coming to campus differently than in a traditional program. For example, many incumbent workers would make fewer visits to campus, come later in the evening or on the weekends, and spend longer lengths of time on campus than other students following a traditional college schedule. The college developed a real-time dashboard that tracks student in-person attendance, use of online materials, and course progress. A coach intrusively intervenes via phone or email if a student is struggling or lagging.
Stark State College	— Collaborations: High schools and vocational schools have been engaged more deeply as part of an outreach and recruitment effort. Several dozen guidance counselors and teachers were invited for a tour of the upgraded manufacturing training facility at the college. Additionally, business partnerships around incumbent worker training have expanded as a result of the grant. The college has been able to leverage several

	grants and funding sources, including the State of Ohio's RAPIDS program and several corporate donations, to augment the equipment purchased and renovations under the grant. — Instructional Transformations: The manufacturing training facilities were renovated, and new equipment was purchased including 3-D printing, master cam, and 3-axis and 5-axis CNC machines. The curriculum was updated to adjust to these new pieces of equipment, plus NIMS certifications and soft skills training were added. — Student Intake, Success, and Career Placement: The renovated lab with new equipment is viewed as an asset for students to advance their careers.
Zane State College	— Collaborations: Employer relationships have been expanded, especially for the industrial systems program. Hiring an instructor with deep industry knowledge and relationships helped invigorate that program, especially because employers communicated frequently with him. The welding program has always had strong employer relationships. Annually, Lincoln Electric helps provide an event that introduces local high school students to welding. Local industry has not been supportive of internships, co-ops, or apprenticeships. — Instructional Transformations: The grant was used for renovations and equipment purchases in the welding and industrial systems programs, and to add coursework. For the welding program, a welding robot was purchased, and a new course was added to provide related instruction. For industrial systems, new trainers were purchased to aid in a variety of courses, and a learning system from Tooling U. was adopted. Lab space was renovated for both programs to accommodate the new equipment. The industrial systems program was expanded to include day courses (previously was evening-only), which are mostly attended by high school students who were not grant participants, although adults may enroll. As part of this, the college improved its dual enrollment pathways for high school students. — Student Intake, Success, and Career Placement: Relying on existing college systems.

The Participants' Voice

As part of the evaluation, a post-completion survey was administered in the quarter after the quarter of completion for all individuals who completed an OTN program of study and were not known to be continuing in further education. The goal was to gain information about the nature of post-completion employment of participants and changes in employment from before enrollment in an OTN grant-affected program. The survey was administered three times per year, each time pursuing a new batch of program completers in an effort to reach as many as possible.

In total, there were 511 responses to the survey that were submitted for analysis. However, many responses were removed from the analysis. The two primary reasons for removal were that a respondent indicated they were not a completer or responses were substantially incomplete beyond the initial survey page. In addition, multiple responses from a single respondent have been removed, leaving only the most recent or most complete survey for analysis per person. After these exclusions, there are 279 survey responses. This represents a total response rate of (27%) of all eligible completers (1033). The count of survey responses by college:

Table 4: Participant Survey Responses By College

College	Number of Survey Responses
Cincinnati State Technical and Community College	24
Columbus State Community College	0
Cuyahoga Community College	11
Eastern Gateway Community College	1
Lakeland Community College	60
Lorain County Community College	29
Owens Community College	27
Rhodes State College	60
Sinclair Community College	41
Stark State College	15
Zane State College	11
Total	279

Appendix C includes the full report of survey responses for the consortium and each college. In summary, of survey respondents, 70% were employed immediately prior to enrollment. Of survey respondents, 37% were employed in their field of study immediately before TAACCCT enrollment. Prior to TAACCCT enrollment, many had been working in that job for years, in fact 16% of them for 10 years or more. Only 15% of all respondents reported earning less than $12/hour, and 15% reported working less than 40 hours/week. A little over half of respondents had benefits available to them (58% for paid time off and 61% for healthcare). During their program, respondents tended to be employed (72%). They did not tend to be involved in internships (10%) or utilize colleges' career services centers (18%). Somewhat more, but still a minority, saw an academic counselor or advisor (42%). Of survey respondents, 21% received college credit for prior learning. After completing their program,

respondents were more likely to be employed in their field of study than they were at the start of their program (69%). Of those who had changed jobs, a majority (70%) considered their new job to be a career advancement and availability of benefits to them were higher (61% for paid time off and 72% for healthcare). Overall, respondents believed that their program would lead to career advancement in the future (78%) and would recommend their program to others (87%).

Impact Evaluation

Outcomes/Impact Analysis Research Questions

The primary impact question posed in OTN's original proposal to DOL is: "What is the impact of the OTN project on participants and other adult learners, particularly with regard to completion and employment rates?"

The impact evaluation questions align with the DOL reporting requirements for the annual performance report. For each question listed, grant participants in the grant-affected programs were compared to comparison group members:

1. How many unique participants/comparisons have been served?
2. How many individuals have completed a grant/comparison program of study?
    a. Of those, how many are incumbent workers?
3. How many individuals are still retained in their program of study (or other grant-funded program)?
4. How many individuals are retained in other education programs?
5. How many credit hours have been completed?
    a. How many students have completed credit hours?
6. How many credentials have been earned by participants/ comparisons?
    a. How many students have earned certificates (<1 year)?
    b. How many students have earned certificates (>1 year)?
    c. How many students have earned degrees?
7. How many students are pursuing further education after program of study completion?
8. How many participants/comparisons are employed after program of study completion?
9. How many participants/ comparisons are retained in employment for three quarters after program of study completion?
10. What are the earnings of participants/ comparisons relative to before enrollment?
    a. How many of those employed at enrollment received a wage increase post-enrollment?
11. What is the time-to-completion of participants / comparisons?

Data Sources

Program personnel collected participant data to identify and track the progress of TAACCCT-funded students at Ohio TechNet (OTN) colleges. As of March 2018, there were 2,248 total TAACCCT participants. Collected participant data includes their demographic characteristics at enrollment, grant-affected course or program participation and completion. This data was self-reported, and there is some resulting missing data. In addition, the colleges provided program worksheets that outline the details of grant-funded courses and programs, including their administrative codes for classification purposes.

To measure academic and employment outcomes for each student, we supplemented the TAACCCT participant data with linked micro-level Higher Education Information (HEI) student records and UI Wage records extracted from the Ohio Longitudinal Data Archive

(OLDA)[3]. With this approach, we were able to minimize the data collection burden on OTN personnel and participants, while leveraging complete and accurate records for all of Ohio's public college students and its workforce. There are, however, four limitations that affect the results reported here:

1. Matching TAACCCT participant records to the OLDA relies on the provision of common identifiers to link individuals across data sets, and to match program and course participation to the HEI data. When an ID is missing for a student, we are unable to directly measure outcomes for that individual. Likewise, linking to the HEI data relies on accurate program and course codes in the program worksheets;
2. The HEI records in the OLDA are updated at the end of each calendar year. UI Wage data are updated quarterly, with up to a six month lag. As of the time of this report, the most recent data available are from Autumn 2017 and Winter 2018[4] for HEI and UI Wage data, respectively. Because the administrative records are not current, there are no matches for the most recently enrolled (or completed) students; and
3. The HEI system tracks only for-credit activity, thus TAACCCT-funded non-credit programs are not fully captured in this analysis.
4. Wage records are not obtainable for individuals employed outside Ohio, which likely has a very minimal impact on the comparison analysis.

Methodological Overview

A key goal of this evaluation is to report the participation and outcomes associated with TAACCCT-funded OTN programming. The primary data collected by program personnel is the most comprehensive data source for this purpose, denoted in the reported results as "All OTN Participants". The outcomes reported align with the components and definitions of the Annual Performance Reporting.

To assess the extent to which OTN programming has positively affected the students it serves, we report outcomes alongside the results of a matched comparison group. For the impact analysis, it was necessary to use the same data sources for the comparison group as the participants (reported as the "Treatment Group") in order to ensure differences measured could be attributed to the impact of the programming and not to methodological variation. We therefore conducted the impact analysis using the HEI and UI Wage data, without supplementation from the data collected by OTN program personnel. In some cases, prioritizing consistency between the treatment and comparison groups results in inconsistencies between All OTN Participants and the Treatment Group.

[3] The Ohio Longitudinal Data Archive is a project of the Ohio Education Research Center (oerc.osu.edu) and provides researchers with centralized access to administrative data. The OLDA is managed by The Ohio State University's Center for Human Resource Research (chrr.osu.edu) in collaboration with Ohio's state workforce and education agencies (ohioanalytics.gov), with those agencies providing oversight and funding. For information on OLDA sponsors, see http://chrr.osu.edu/projects/ohio-longitudinal-data-archive.

[4] UI Wage records for 2018 quarter 1 (winter) are preliminary data.

Propensity Matching

We constructed the sample for the impact analysis from the HEI student data, using the following parameters:

1. Students must have been enrolled in a public community college during the grant period (during or after the Spring term of 2015);
2. They must have been enrolled as an undergraduate student (this excludes high school students, graduate students and professional students); and
3. They must have been enrolled in an OTN-relevant subject (defined as enrollment in a major, program, or course with a subject code that aligns with TAACCCT-funded programming) (see Appendix C.)

We matched OTN TAACCCT participants to this sample and assigned those individuals to the Treatment group. Participants who were non-credit students, missing a linkage identifier, and/or first enrolled as a TAACCCT participant after Autumn 2017 were excluded from the impact analysis because they could not be matched to the HEI data (Table 5). We excluded from the analysis non-participants enrolled at OTN colleges. In addition, we excluded students enrolled at other TAACCCT-funded Ohio colleges: Clark State, North Central State, and Northwest State.

The comparison group pool consisted of the remaining students who enrolled in a public community college in Ohio during the grant period, in an OTN-relevant subject area. From this pool, we conducted propensity score matching to select the students who were the most similar to OTN participants in their demographic characteristics and employment history. Specifically, we conducted logistic regression to predict OTN participation using the following variables:

1. Birth year quintiles (age): 1997-2000, 1994-1996, 1990-1993, 1981-1989, 1980 or earlier
2. Gender
3. Race/ethnicity: White, Other, Missing
4. Employment history totaled across the 4 quarters preceding enrollment (mean earnings, CPI adjusted to 2017 dollars, and number of weeks worked)
5. Major: 1 digit CIP for OTN–relevant subjects, Other subjects, Missing/Undecided Major
6. Year/Term of Enrollment

We did 1-to-1 nearest neighbor matching without replacement (i.e. the same matched case cannot be used multiple times), applying a caliper of 0.25*standard deviation. We tested for sample balance using the chi square statistic for categorical variables and the Cohen d statistic, and the ratio of the estimated variances.

All tests indicated the treatment and comparison groups are appropriately balanced for birth year, gender, and employment history. There are more White OTN participants than in the comparison group (p=.01); and there were some imbalances by enrollment year/term. There are more OTN participants with a major in the 400000 CIP series, fewer with majors in the 010000 and 50000 CIP series, and fewer with a non-OTN CIP code. This is to be expected given that the schools with a greater emphasis on OTN-relevant CIP codes were strategically

selected into OTN. Because the total pool of comparison cases was restricted to individuals who had to have been enrolled in an OTN-relevant major, program, or course, we determined the imbalance between specific CIP categories to be acceptable. We summarize the resulting analytic sample in Tables 5, 6, and 7.

The majority of TAACCCT participants and comparison group students are male and white, and well over two-thirds are incumbent workers. More than half of OTN participants are part time students. Indicators for veteran status, disability status, Pell and TAA eligibility, and full-time versus part-time enrollment in college are not available in the HEI and are therefore reported only for All OTN participants using the data collected by program personnel.

Table 5: TAACCCT Participants and Comparison Group, Overall

	All OTN Participants	Treatment Group	Comparison Group
Total Students	2,248	1,471	1,470
Enrolled in For-Credit Programs	1,803[5]	1,471	1,470
Enrolled in Non-Credit Programs	445	0	0
Missing Matching ID	269	0	0
Enrolled After Autumn 2017	210	0	0

Table 6: Student Characteristics, Overall

	All OTN	All OTN	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Individuals	2,248	100.0	1,471	100.0	1,470	100.0
Age	2,232	30.0	1,455	28 (mean)	1,470	28 (mean)
Male	1,994	89.5	1,339	90.2	1,333	90.1
White	1,821	85.0	1,129	82.8	1,250	86.5
Black	279	13.0	149	10.9	68	4.7
Hispanic	88	4.7	52	3.8	78	5.4
Other	69	3.2	26	1.9	24	1.7
More than one race	50	2.3	<10	<10	25	1.7
Incumbent Worker	1,550	69.5	1,060	72.1	1,074	73.1
Veteran	122	5.5	n/a	n/a	n/a	n/a
Disabled	67	3.0	n/a	n/a	n/a	n/a
Pell Eligible	477	21.4	n/a	n/a	n/a	n/a
TAA Eligible	62	2.8	n/a	n/a	n/a	n/a
Full Time	790	43.4	n/a	n/a	n/a	n/a
Part Time	1,031	56.6	n/a	n/a	n/a	n/a

[5] Includes students not found in the HEI data due to missing identifiers and/or 2018 enrollment that succeeds the most recent available HEI data.

Table 7: TAACCCT Participants and Comparison Group, Institutional Distribution

	All OTN	All OTN (%)	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Students	2,248[6]	100.0	1,471	100.0	1,470	100.0
Cincinnati	252	11.2	229	15.6	0	0
Columbus	143	6.4	95	6.5	0	0
Cuyahoga	103	4.6	57	3.9	0	0
Eastern Gateway	26	1.2	18	1.2	0	0
Lakeland	268	11.9	171	11.6	0	0
Lorain	144	6.4	96	6.5	0	0
Owens	229	10.2	217	14.8	0	0
Rhodes	453	20.1	107	7.3	0	0
Sinclair	255	11.3	133	9.0	0	0
Stark	198	8.8	183	12.4	0	0
Zane	178	7.9	165	11.2	0	0
Belmont	0	0	0	0	144	9.8
Central Ohio	0	0	0	0	118	8.0
Edison	0	0	0	0	208	14.2
Hocking	0	0	0	0	118	8.0
Marion	0	0	0	0	131	8.9
Rio Grande	0	0	0	0	67	4.6
Southern State	0	0	0	0	43	2.9
Terra	0	0	0	0	548	37.3
Washington	0	0	0	0	93	6.3

[6] One student enrolled in two OTN colleges.

Outcomes

Table 8 provides an overview of the principal OTN outcomes and the share of participants that achieved those outcomes.

Table 8: Outcomes, All OTN Participants

	All OTN (N)	All OTN (%)
Participants	2,248	100.0
Completers	1,033[7]	46.0
Incumbent Completers[8]	713	31.7
Non-Incumbent Completers	310	13.8
Retained in Program	341	15.2
Retained in Other Program	110	4.9
Employed First Quarter Post-Completion[9]	107	4.8
Employed 3 Consecutive Quarters Post-Completion[10]	73	3.2
Continued in Further Education[11]	157	7.0
Earnings Increase Post-Enrollment[12]	1,025	45.6
Students Earning Any Credential[13]	1,040	46.3
Total Credentials Earned	1,990	1.9 (mean)
Students Earning Certificates (<1yr)	1,004	44.7
Students Earning Certificates (>=1yr, <2yrs)	12	0.5
Students Earning Degrees	60	2.7
Number Completing Grant Affected Credit Hours[14]	1,523	67.8
Number of Grant Affected Credit Hours completed	6,777	4.4 (mean)

[7] Of the 2,248 participants, 210 (9.3 percent) first enrolled as TAACCCT participants in Spring 2018; two-thirds of these recent enrollees had not yet completed as of March 2018 when data were collected for this report.

[8] Incumbent worker status is missing for 10 completers.

[9] 41.2% of non-incumbent completers with available employment data.

[10] 35.1% of non-incumbent completers with available employment data.

[11] 15.2% of completers. Excludes non-incumbent workers who were reported as employed 1 quarter post-completion. For each participant, program personnel indicated whether the student was continuing enrollment in a grant-affected program. Additionally, we matched participant records to HEI enrollment data through Autumn 2017 to capture further enrollment at different postsecondary institutions. The HEI system includes all public colleges in Ohio. Continuing education at private or out-of-state institutions are not included.

[12] 66.1% of incumbent workers

[13] We used the OTN participant and program data to calculate the metrics as follows: For each completer, we assigned the award(s) associated with their completed grant-affected program(s). For some colleges and programs, completion of a program does not directly imply award receipt. In these cases, we only included awards in the calculation when explicitly indicated in the data collected by program personnel. We then totaled completed program awards and credentials as recorded by program personnel.

[14] 84.5% of for-credit students. We calculated credit hours earned by matching OTN for-credit students to their HEI course records and filtering course outcome data to include only courses completed during the grant and course codes that were specified in the OTN program worksheets. The available HEI data includes course outcomes through Autumn 2017. To estimate additional credit hours for students who could not be matched to HEI data, for each grant-affected course specified in the data collected by program personnel we applied the average number of credit hours earned for that course code as found for students who did have a match to the HEI. For any remaining for-credit students with unassigned credit hours, we assigned one credit hour for each completer as a minimum estimate.

Comparison Analysis

Table 9 indicates there are significantly more completers and students who are retained in the treatment group than in the comparison group, and significantly fewer in the treatment group are retained in another program.

We defined completers as students who earned any degree or certificate while enrolled in an OTN subject area during the grant-affected period, as reported by ODHE in the HEI system.[15] Award information is available through Spring 2017; any awards that were earned in Summer 2017 through Spring 2018 are not included.

Table 9: Program Outcomes

	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Individuals	1,471	100.0	1,470	100.0
Completers	358	24.3*	237	16.1
Retained in Program	776	52.8*	597	40.6
Retained in Other Program	20	1.4	146	9.9*

*p<0.05

Over 50 percent of non-incumbent workers were employed in Ohio[16] in the quarter after completing an OTN program and exiting, and 46 percent were retained in employment for 3 consecutive quarters (Table 10). To measure employment among non-incumbent workers, we converted the academic terms to fiscal quarters and then counted the number of individuals whose UI Wage records indicated greater than zero earnings during the quarter after which the most recent award was earned. These outcomes are a minimum estimate of employment; for students who completed after Spring 2017 a full 3 quarters of employment data are not yet available.[17]

[15] In contrast, for All OTN participants, OTN program personnel assigned completer status using the specific requirements for completion of TAACCCT-funded programs. The reported totals include all OTN participants, including non-credit participants, and completion through March 2018. For some colleges there are more completers reported for the treatment group than among all OTN participants. The outcomes that rely on completion (employment among non-incumbent workers and continuation in further education) reflect this undercounting of completers in the treatment and comparison groups.

[16] UI Wage records exclude out-of-state employment.

[17] Throughout the grant period, program personnel supplemented the UI Wage data with a survey of completers in an attempt to supply the most complete and timely data possible for APR reporting. Data lag concerns were largely resolved by ending new grant activity in March 2018, allowing time for the UI Wage records to catch up. As of final reporting, UI Wage records are available through 2018Q1 (final data through 2017Q4, preliminary data 2018Q1).

Table 10: Post-Completion Outcomes, Employment[18] – Non-Incumbent Completers

	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Non-Incumbent Completers	100	100.0	84	100.0
Employed First Quarter Post-Completion	52	52.0*	22	26.2
Employed 3 Consecutive Quarters Post- Completion	46	46.0*	15	17.9

*p<0.05

Significantly more OTN completers (treatment group) continued in further education than completers from the comparison group (Table 11). Because the exit timing of treatment and comparison cases is defined as the last term in which a student was enrolled in an OTN-relevant subject, this outcome is based only on the enrollment of completers in a different college. Given this approach, it is therefore not technically possible to continue in an OTN subject after exit. In all cases, any completer who was enrolled in the last term of available data was counted as continuing in further education.

Table 11: Post-Completion Outcomes, Further Education – Completers

	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Completers	358	100.0	237	100.0
Continued in Further Education[19]	110	30.7*	37	15.6

The majority of incumbent workers experienced earnings gains after enrollment, although this was not unique to OTN participants (Table 12). We operationalized earnings increases as follows: among students with non-zero earnings during their first enrollment term of the grant period, we counted an increase if any subsequent quarterly earnings were greater than their earnings in their first grant-affected enrollment quarter, with all earnings CPI adjusted to 2017 dollars.

Table 12: Participant Outcomes, Incumbent Worker Earnings

	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Incumbent Workers	1,060	100.0	1,074	100.0
Earnings Increase Post-Enrollment	968	91.3	979	91.3

Additional employment data was presented in an Employment and Earnings Results Scorecard, attached in Appendix D. This scorecard data does not include a comparison group, but indicates the following that among participants, twelve months after enrollment:

- 57% of all participants became employed or experienced an earnings increase.
- 62% of participants employed at enrollment experienced an earnings increase, compared to earnings three months before enrollment.
- 45% of participants unemployed at enrollment became employed.

[18] Denominators exclude individuals who were missing available employment data
[19] Excludes non-incumbent workers who were reported as employed 1 quarter post-completion

- 43% of participants unemployed at enrollment experienced an earnings increase, compared to earnings three months before enrollment.
- Success rates will likely increase as individuals continue to transition from school into fully engaged employment.

Participant earnings compared to earnings three months before enrollment:

- Overall, participant earnings increased by 25%. ($23,500/yr on average at start)
- Participants unemployed at enrollment experience an average earnings increase from $8,300/ yr to $19,000/ yr.
- Participants that were employed at enrollment experienced an average earnings increase from $25,600/ yr to $32,500/ yr.

Among individuals that completed programs, twelve months after enrollment:

- 58% of all completers became employed or experienced an earnings increase.
- 62% of completers employed at enrollment experienced an earnings increase.
- 49% of completers unemployed at enrollment became employed.
- 47% of completers unemployed at enrollment experienced an earnings increase.
- Success rates will likely increase as individuals continue to transition from school into fully engaged employment.

Completer earnings twelve months after completion:

- Overall, earnings of completers increased by 39%. ($24,800/yr on average at start)
- Completers unemployed at enrollment experience an average earnings increase from $9,800/ yr to $25,000/ yr.
- Completers employed at enrollment experience an average earnings increase from $26,800/ yr to $37,400/ yr.

Table 13 reflects the OTN strategic prioritization of short-term programming, intended to reduce time to completion. Overall, the number of students who earned awards is greater among the treatment group than among the comparison group. The average number of degrees or certificates earned per person during the grant period is greater, and specifically the proportion of students earning less than one year awards is greater. In contrast, more students in the comparison group earned degrees.[20]

[20] The metrics reported for the treatment and comparison groups differ from the All OTN metrics in several ways: 1) Non-credit certificates and industry credentials are not captured in the HEI system and are therefore excluded from the treatment and comparison group totals; 2) The HEI system categorizes certificates as "less than one year" or "one year or more but less than two years", whereas the APR reporting convention is to categorize certificates earned as "one year or less" or more than one year". Students who earned 1 year certificates are therefore reported as "less than 1 year" in the All OTN totals and as "1 year to less than 2 years" in the Treatment and Comparison group totals; 3) The number of degrees and certificates reported is a count of the awards earned while enrolled in an OTN-relevant subject during the grant period. In some cases, these may be awards that were not specifically grant-funded; and 4) Degrees and certificates earned undercount credentials earned in by TAACCCT participants who enrolled in Summer 2017 or later.

Table 13: Participant Outcomes, Credentials Earned

	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Individuals	1,471	100.0	1,470	100.0
Earned Any Credential	358	24.3*	237	16.1
Total Credentials Earned	558	1.6* mean	316	1.3 mean
Earned less than 1yr Certificates	245	68.4*	58	24.5
Earned 1-to- 2 year Certificates	53	14.8	30	12.7
Earned Degrees	137	38.3	186	78.5*

*p<0.05

Significantly more OTN participants completed credit hours than the comparison group; the average number of hours completed is similar between the two groups (Table 14). We used the HEI course data to calculate credit hour outcomes for the impact analysis by limiting the data to include only course hours that had been successfully completed during the grant affected time period. To approximate grant-affected coursework, we then restricted these earned course hours to courses with OTN-relevant subject codes.[21]

Table 14: Participant Outcomes, Credit Hours Completed

	Treatment (N)	Treatment (%)	Comparison (N)	Comparison (%)
Total Individuals	1,471	100.0	1,470	100.0
Total For-Credit Students	1,471	100.0	1,470	100.0
Number Completing Grant Affected Credit Hours	1,351	91.8*	1,154	78.5
Number of Grant Affected Course Credit Hours Completed (mean per term, per person)	16,510	2.7 (mean)	9,114	2.8 (mean)

*p<0.05

Analyses covering outcomes for each of the colleges, as well as several subgroups are included in Appendix C.

[21] Because these may include courses that are OTN-related but not specifically grant-affected, the number of students earning credit hours and the number of credit hours earned are higher for the treatment group than for All OTN participants.

Summary

The Ohio TechNet initiative accomplished its objectives. It successfully administered a $15 million federal grant that was focused on improving collaboration among disparate entities in the state, improving labor-responsive programming in manufacturing, and encouraging student success.

In a quasi-experimental analysis, OTN participants outperformed comparison group members in several outcomes:

- Participants had higher rates of completion (+8.2 percentage points) and program retention (+12.2 percentage points) than comparisons.
- Of those enrolled in for-credit programs, participants had higher rates of completing any credit hours (+13.3 percentage points) and similar numbers of credits completed per term.
- Participants had higher rates of continuation into further education at a different college (+15.1 percentage points).

This appears to be the result of three factors: (1) increased focus on employer-aligned programs, (2) integration of student-focused delivery models and services, and (3) significant reconfiguration of programs around shorter-term post-secondary and industry-recognized credentials. This is demonstrated in several ways:

- More participants earned any credential (+8.2 percentage points) resulting from increased focus on shorter-term credentials.
- More credentials were earned during the grant period (1.6 for participants vs. 1.3 for comparisons).
- More short-term certificates <1yr (+43.9 percentage points) resulted in the participant group.
- Comparisons were much more focused on 2-year degrees (+40.2 percentage points more than participants).

Participants experienced successful labor market outcomes, although did not always outperform the comparison group.

- 73% of all participants became employed or experienced an earnings increase after program completion; 60% of participants unemployed at enrollment became employed within the first year after program completion; 80% of participants employed at enrollment experienced an earnings increase after program completion, compared to earnings three months before enrollment.
- Overall, participant earnings increased by 39%. ($24,800/yr on average prior to enrollment and $34,500 four quarters after program completion); participants unemployed at enrollment experience an average earnings increase from $9,900/ yr in the year prior to enrollment to $25,000/ yr four quarters after program completion; participants that were employed at enrollment experienced an average earnings increase from $26,800/ yr to $37,400/ yr.
- Unemployed completers had a higher rate of employment in the first quarter after completion and were retained in employment at a higher rate for the first three quarters after completion than unemployed comparisons.

- However, while the majority of incumbent participants experienced ‘any earnings increase’ post-completion, comparison group members who were incumbent workers similarly achieved ‘any earnings increase’ post-completion.

Appendix A: Project Description

The Ohio Technical Skills Innovation Network (TechNet) consortium includes eleven colleges in Ohio that have joined forces to address workforce challenges in advanced manufacturing. The consortium is led by Lorain County Community College in Lorain, OH. The other consortium colleges are: Cincinnati State Technical and Community College, Columbus State Community College, Cuyahoga Community College, Eastern Gateway Community College, Lakeland Community College, Owens Community College, Rhodes State College, Sinclair Community College, Stark State College, and Zane State College.

The consortium adopted three strategies:

1) Create mechanisms for statewide collaboration among consortium partners and economic and workforce development allies that help advance Ohio's innovation economy.
2) Transform instructional design and delivery systems for customization to student needs and rapid response to labor market demand.
3) Expand best practices that redesign student intake, placement, and success.

Programs and pathways were in the areas of Welding, CNC/Machining, Industrial Maintenance, Digital Fabrication/Industrial Automation; and Occupational Safety. In addition to programmatic enhancements and promotion of deeper collaboration among partners, a focus on veterans and entrepreneurship training was incorporated in the grant proposal.

Intervention

The consortium work plan was divided into three primary strategies:

Strategy 1: Create mechanisms for statewide collaboration among consortium partners and economic and workforce development allies that help advance Ohio's innovation economy

This strategy responded to a lack of alignment between the TechNet community colleges, public workforce and economic development, existing state initiatives and projects, and employers and industry partners. The strategy intends to improve collaboration among these entities. The theory is that enhanced collaboration will enable colleges to marshal resources to make programmatic improvements. Additionally, the consortium intends to collaborate with partners such as the Ohio Manufacturers Association to develop a policy agenda. The strategy envisions establishing structures that bring together grant partners, leverage existing projects and initiatives in the state, and establishes processes for using this consortium as a platform for promoting policy and systems improvements statewide. Figure 1 depicts the logic model.

Strategy 2: Transform instructional design and delivery systems for customization to individual student needs and rapid response to labor market demand.

This strategy responds to a need to update, enhance, and scale programs that meet industry needs while concurrently providing accelerated, accredited skills training/education for transitioning adults. Enhancements include new or improved curricula, facilities, and

equipment; new uses of technology and innovative instructional models, and upfront & continuing engagement with employers. A focus on veterans and entrepreneurs is incorporated in this strategy. The grant participant outcomes (DOL Outcomes 1 through 9) are driven by this strategy. The theory is that programmatic improvement will lead to improved participant connections to jobs and career advancement in manufacturing due to better alignment between instruction and skills demanded by businesses as well as accelerated readiness for employment or paid work-based learning. Due to the fact that colleges exist in different contexts with varying needs and constraints, the proposal TechNet submitted to the Department of Labor is diffuse in describing this strategy. A variety of programmatic activities are described, but specific models are not prescribed to particular partners. Nor is it expected that partners will participate evenly in the list of activities. Thus, the evaluation approach will rely heavily on the implementation evaluation to capture and determine the specifics of on-the-ground implementation, so they can be attributed in the impact evaluation. Figure 2 depicts the logic model.

Strategy 3: Expand best practices that redesign student intake, success, and placement. This strategy responds to a need to enhance practices that support student retention and completion in targeted programs. Key features include the incorporation of approaches for intrusive advising, intensive student support services, job readiness training, and the incorporation of prior learning credit. It also incorporates an approach for aligning and articulating non-credit credentials delivered by Ohio's non-credit Technical Center system – a separate and sometimes parallel adult vocational training system. The theory is that these activities will promote increases in student retention and completion in targeted programs, and job attainment. Similar to Strategy 2, the proposal that TechNet submitted to the Department of Labor is diffuse in describing this strategy. Strategy 1, which aims to add cohesion to the initiative, will interact with this strategy, as well as Strategy 2. And similarly, the evaluation approach will rely heavily on the implementation evaluation to capture and determine the specifics of on-the-ground implementation, so they can be attributed in the impact evaluation. These strategies are intended to positively impact student retention and completion rates. As such, outcomes related to these measures are incorporated into this strategy. Figure 3 depicts the logic model.

Figure 1: Strategy 1 Logic Model - Create mechanisms for statewide collaboration among consortium partners and economic and workforce development allies that help advance Ohio's innovation economy

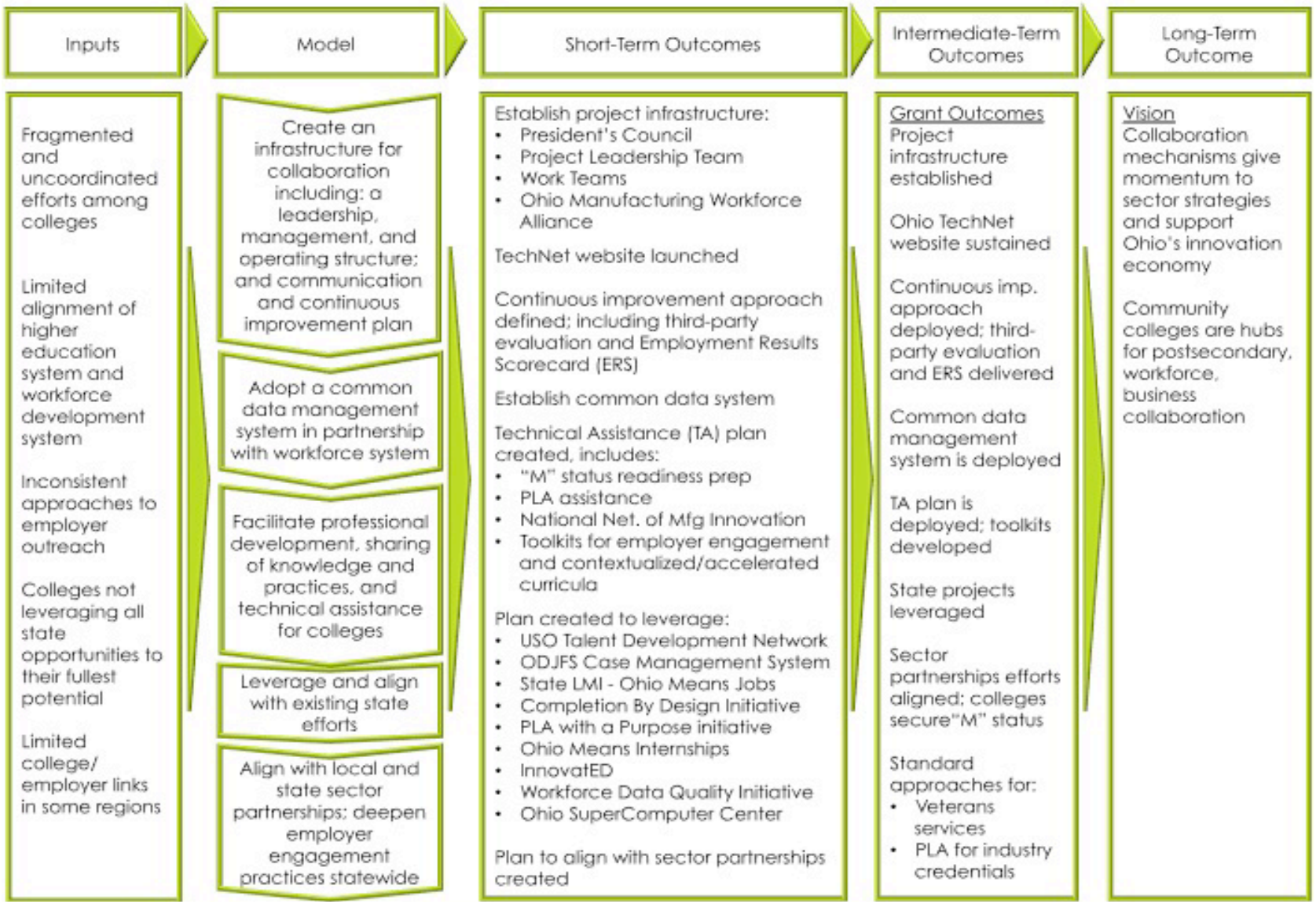


Figure 2: Strategy 2 Logic Model - Transform instructional design and delivery systems for customization to individual student needs and rapid response to labor market demand

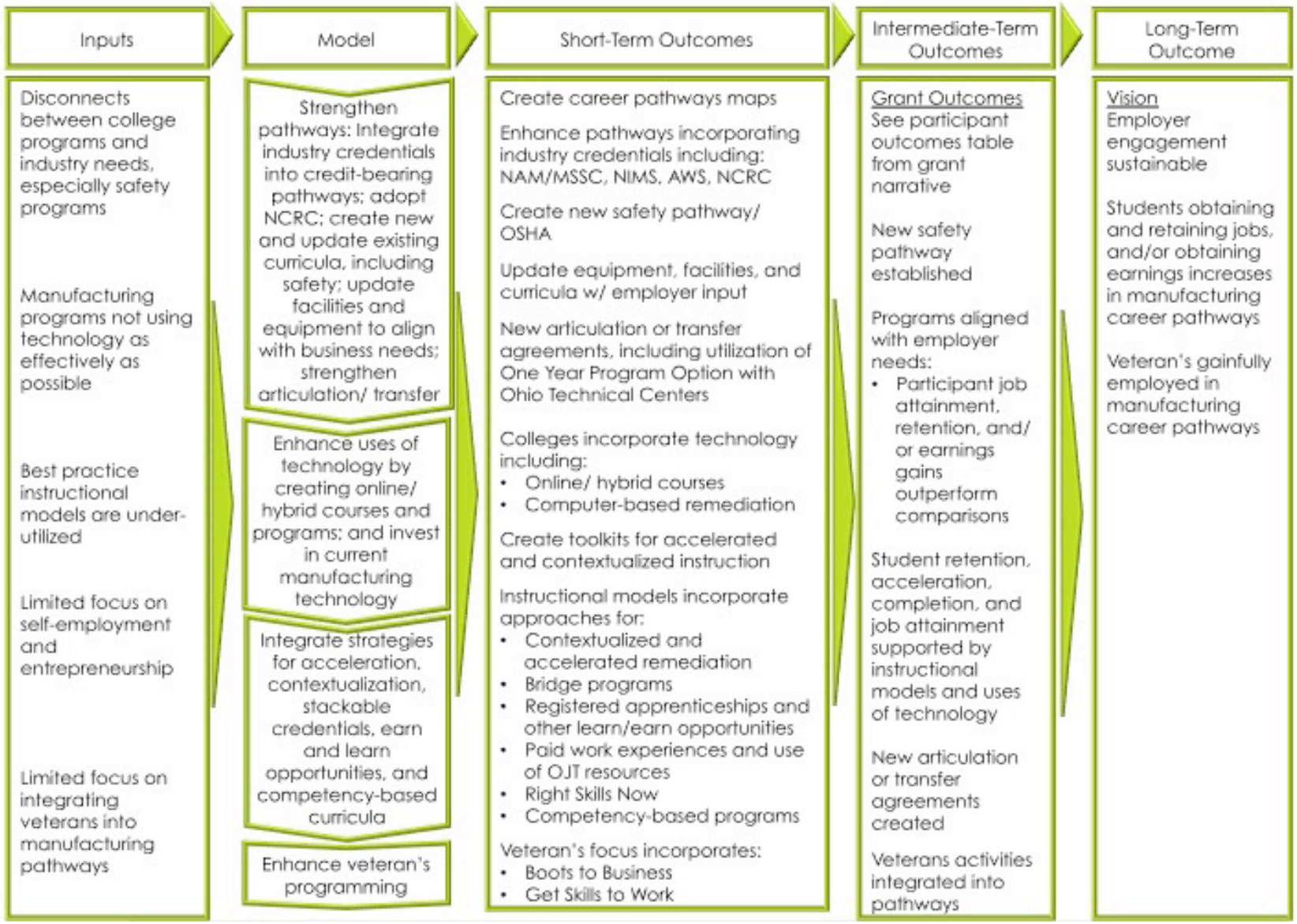
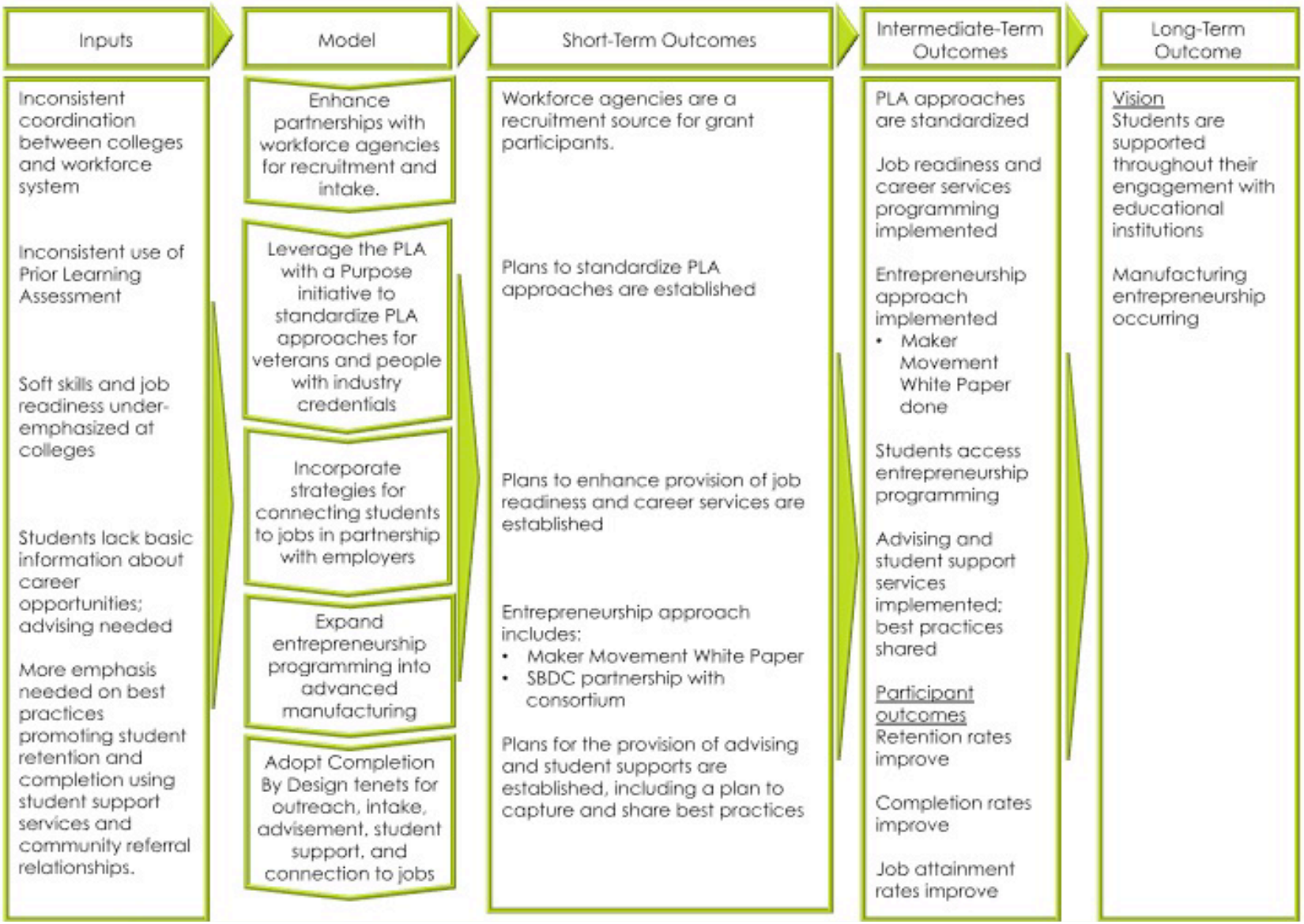


Figure 3: Strategy 3 Logic Model - Expand best practices that redesign student intake, placement, and success.



Enrollment in targeted pathways defined grant participation. Enrollment was determined based on declaration of a targeted program of study or enrollment in a core course as defined by USDOL. Within the TechNet consortium, there were certificate and degree pathways in five key areas. Colleges determined their areas of participation, which are listed below:

College	Welding	CNC/ Machining	Industrial Maintenance	Digital Fabrication/ Industrial Automation	Occupational Safety
Cincinnati State Technical and Community College	X	X	X		
Columbus State Community College	X		X		
Cuyahoga Community College	X				X
Eastern Gateway Community College	X				
Lakeland Community College	X		X		
Lorain County Community College	X	X	X	X	X
Owens Community College	X	X			
Rhodes State College	X	X	X	X	
Sinclair Community College		X	X		
Stark State College		X			
Zane State College	X		X		

Appendix B: Grant Deliverable Assessment

Strategy One: Create mechanisms for statewide collaboration	
Scope of Work Element	Status
Create an organizational structure that supports collaboration, including: a. President's Council b. Project Leadership Team c. Work Teams A multi-partner coalition called the Ohio Manufacturing Workforce Alliance	• College presidents convened several times during the grant. Meetings typically coincided with President's meetings held by the Ohio Association of Community Colleges. • Project leadership team is operational and includes functions for overall management, reporting, accounting, data management, and communications. • "Affinity groups" have been formed for Data Managers, Project Managers, and Navigators. • OTN has a deepening partnership with the Ohio Manufacturers' Association, exemplified by OTN's participation in OMA's quarterly convening of state agency leaders. • OTN is staffing the Ohio Manufacturers Career Council, which is emerging as a initiative of the LIFT project.
Create an internal communication infrastructure including an OTN website and a continuous improvement system.	• OTN website is launched; additionally, OTN distributes a weekly email newsletter to partners. • OTN hosts weekly consortium calls and quarterly in-person consortium meetings. • A continuous improvement system has been established driven by progress against outcomes and spending goals established for each college. • OTN purchased a subscription to EduFactor, an online resource of videos and outreach materials to help recruit younger people into manufacturing. - A graphic designer has been contracted to develop OTN print and online materials.
Develop a common data management system in partnership with workforce partners.	- A data management system was established that leveraged the Ohio Longitudinal Data Archive which integrates data from the Higher Education Information System, and UI Quarterly Earnings Records databases.
Provide professional development and	- Professional development opportunities

technical assistance including: support for colleges to achieve M-list status, adopt Prior Learning Assessment (PLA) tools and strategies, enhanced partnerships with National Network of Manufacturing Institutes (NNMI), toolkits for employer engagement and contextualized/ accelerated curricula	and tools emerged including 10 out of 11 schools achieved M Status, a PLA initiative was launched in partnership with Ohio Department of Higher Education, partnerships with the NNMI's LIFT and NextFlex resulted in new projects, and technical assistance/ professional development support was available to schools for apprenticeships, employer engagement, competency-based education, and other educational models.
Leverage and align with state initiatives and systems including: Talent Development Network, Ohio Workforce Case Management System, State Labor Market Information, Completion By Design, PLA with a Purpose, Ohio Means Internships, InnovatED, Workforce Data Quality Initiative, and Ohio Super Computer.	- The project leveraged several state initiatives, most notably Ohio Talent Development Network, ODHE's PLA with a Purpose, a federal apprenticeship grant via the Ohio Department of Job and Family Services, and LIFT's Manufacturing Foundations initiative.
Align with local and state sector partnerships	- A partnership was established and deepened with the Ohio Manufacturers Association to support the development of sector partnerships throughout the state.
Strategy Two: Transform Instruction Design and Delivery	
Strengthen pathways by: integrating industry credentials, adopting the National Career Readiness Certificate, developing new and updated curricula, focusing on safety instruction, updating facilities and equipment, and establishing new articulation/ transfer opportunities.	- The colleges heavily invested in equipment, renovated space, updated and new curricula featuring industry credentials, apprenticeships, and new articulation and transfer opportunities.
Enhance technology by adopting online/ hybrid courses and integrating current manufacturing technology and equipment into programs	- Many colleges developed or adopted new online and hybrid courses; nearly all colleges enhanced equipment.
Integrate curriculum design innovations focusing on: acceleration, contextualization, stackable credentials, earn and learn, and competency-based education.	- Colleges integrated numerous curriculum innovations including models for acceleration, contextualization, stackable credentials, earn and learn, and competency-based education.
Enhance veteran's programming	- A veteran's service guide was developed; targeted recruitment of veterans occurred.
Strategy Three: Expand best practices for intake, success, and placement	
Enhance partnerships with workforce agencies for recruitment and intake.	- All colleges worked to develop or enhance recruitment and intake relationships with their local workforce agencies.

Leverage PLA with a Purpose with focus on veterans and people with industry credentials.	- The consortium developed a strong relationship with the PLA with a Purpose initiative leading to the creation of FastPathOhio.com, a statewide online tool for students to assess their potential to earn PLA credit.
Enhance strategies for connecting students to jobs in partnership with employers.	- A wide variety of practices occurred locally to engage employers with colleges listing 450+ employers as partners.
Expand entrepreneurship programming.	- Entrepreneurship programming had a limited focus in the grant; however, opportunities to pursue programming were available to students in spots.
Adopt Completion By Design tenets	- Most prominently, Student Navigators were hired at each college to provide recruitment and coaching support to students. Other student success measures were undertaken in spots.

Appendix C: Impact Evaluation Tables - SubGroups

College-level Results

Student Characteristics, by College

	Cincinnati	Columbus	Cuyahoga	Eastern Gateway	Lakeland	Lorain	Owens	Rhodes	Sinclair	Stark	Zane
Total	252	143	103	26	268	144	229	453	255	198	178
Age	27.6	27.7	29.6	28.9	27.4	38.3	27.2	32.5	32.1	30.1	27.2
Male	226	128	95	20	235	129	208	386	226	182	160
White	184	99	49	14	231	118	181	392	201	186	167
Black	47	34	46	13	30	13	32	36	18	<10	<10
Hispanic	<10	<10	<10	<10	<10	14	15	13	11	<10	<10
Other	<10	<10	11	<10	<10	<10	<10	11	<10	<10	<10
More than one race	<10	<10	12	<10	<10	<10	<10	<10	<10	<10	<10
Incumbent Worker	181	89	47	12	191	52	168	347	222	147	95
Veteran	<10	11	<10	<10	<10	12	13	25	11	19	14
Disabled	<10	<10	<10	<10	<10	<10	13	<10	<10	12	<10
Pell Eligible	47	24	27	19	42	46	54	59	45	61	53
TAA Eligible	<10	<10	<10	<10	<10	42	<10	<10	<10	<10	<10
Full Time Enrollment	100	45	11	26	57	98	69	95	64	91	134
Part Time Enrollment	135	57	59	<10	211	46	160	118	94	107	44

Program Completers, by College

	All OTN	All OTN (%)
Total	1,033	46.0
Cincinnati	106	42.1
Columbus	24	16.8
Cuyahoga	34	33.0
Eastern Gateway	<10	<10
Lakeland	196	73.1
Lorain	99	68.8
Owens	64	28.0
Rhodes	260	57.4
Sinclair	101	39.6
Stark	115	58.1
Zane	33	18.5

Non-Incumbent Completers, by College

	All OTN (N)	All OTN (%)
Total	310	13.8
Cincinnati	27	10.7
Columbus	11	7.7
Cuyahoga	16	15.5
Eastern Gateway	<10	<10
Lakeland	52	19.4
Lorain	57	39.6
Owens	14	6.1
Rhodes	78	17.2
Sinclair	13	5.1
Stark	22	11.1
Zane	20	11.2

Retained in Program, by College

	All OTN (N)	All OTN (%)
Total	341	15.2
Cincinnati	80	31.7
Columbus	57	39.9
Cuyahoga	<10	<10
Eastern Gateway	10	38.5
Lakeland	<10	<10
Lorain	25	17.4
Owens	53	23.1
Rhodes	<10	<10
Sinclair	88	34.5
Stark	<10	<10
Zane	28	15.7

Retained in Other Program, by College

	All OTN (N)	All OTN (%)
Total	110	4.9
Cincinnati	15	6.0
Columbus	16	11.2
Cuyahoga	<10	<10
Eastern Gateway	<10	<10
Lakeland	<10	<10
Lorain	<10	<10
Owens	25	10.9
Rhodes	<10	<10
Sinclair	31	12.2
Stark	<10	<10
Zane	16	9.0

Continued in Further Education, by College – Completers

	All OTN (N)	All OTN (%)
Total	157	15.2
Cincinnati	25	23.6
Columbus	<10	<10
Cuyahoga	<10	<10
Eastern Gateway	<10	<10
Lakeland	<10	<10
Lorain	34	34.3
Owens	27	42.2
Rhodes	<10	<10
Sinclair	47	46.5
Stark	<10	<10
Zane	<10	<10

Students Earning Any Credential, by College

	All OTN (N)	All OTN (%)
Total	1,040	46.3
Cincinnati	106	42.1
Columbus	24	16.8
Cuyahoga	86	83.5
Eastern Gateway	<10	<10
Lakeland	196	73.1
Lorain	77	53.5
Owens	64	27.9
Rhodes	253	55.8
Sinclair	101	39.6
Stark	103	52.0
Zane	29	16.3

Total Credentials Earned, by College

	All OTN (N)	All OTN (mean)
Total	1,990	1.9
Cincinnati	133	1.1
Columbus	27	1.1
Cuyahoga	217	2.5
Eastern Gateway	<10	<10
Lakeland	587	3.0
Lorain	106	1.4
Owens	151	2.4
Rhodes	318	1.3
Sinclair	208	2.1
Stark	177	1.7

Zane	65	2.2

Students Earning <1 Year Certificates, by College

	All OTN (N)	All OTN (%)
Total	1,004	44.7
Cincinnati	106	42.1
Columbus	12	8.4
Cuyahoga	84	81.6
Eastern Gateway	<10	<10
Lakeland	196	73.1
Lorain	63	43.8
Owens	63	27.5
Rhodes	253	55.8
Sinclair	98	38.4
Stark	100	50.5
Zane	29	16.3

Students Earning Other Certificates/Degrees[22], by College

	All OTN (N)	All OTN (%)
Total	70	3.1
Cincinnati	<10	<10
Columbus	12	8.4
Cuyahoga	<10	<10
Eastern Gateway	<10	<10
Lakeland	<10	<10
Lorain	19	13.2
Owens	<10	<10
Rhodes	<10	<10
Sinclair	14	5.5
Stark	<10	<10
Zane	10	5.6

[22] Combined categories due to small cell sizes

Number of Students Completing Grant Affected Credit Hours, by College

	All OTN (N)	All OTN (%)
Total	1,523	67.8
Cincinnati	199	79.0
Columbus	74	51.7
Cuyahoga	63	61.2
Eastern Gateway	17	65.4
Lakeland	208	77.6
Lorain	117	81.3
Owens	206	90.0
Rhodes	166	36.6
Sinclair	164	64.3
Stark	168	84.8
Zane	141	79.2

Number of Grant Affected Credit Hours Earned, by College

	All OTN (N)	All OTN (mean)
Total	6,777	4.4
Cincinnati	906.5	4.6
Columbus	365	4.9
Cuyahoga	339	5.4
Eastern Gateway	82	4.8
Lakeland	862.5	4.1
Lorain	666	5.7
Owens	513	2.5
Rhodes	645	3.9
Sinclair	733	4.5
Stark	880	5.2
Zane	785	5.6

Employed First Quarter Post-Completion, by College – Non-Incumbent Completers

	All OTN (N)	All OTN (%)
Total	107	34.5
Cincinnati	13	48.1
Columbus	<10	<10
Cuyahoga	<10	<10
Eastern Gateway	<10	<10
Lakeland	16	30.8
Lorain	24	42.1
Owens	<10	<10
Rhodes	12	15.4
Sinclair	<10	<10
Stark	<10	<10
Zane	<10	<10

Employed 3 Consecutive Quarters Post-Completion, by College – Non-Incumbent Completers

	All OTN (N)	All OTN (%)
Total	73	23.5
Cincinnati	<10	<10
Columbus	<10	<10
Cuyahoga	<10	<10
Eastern Gateway	<10	<10
Lakeland	16	30.8
Lorain	<10	<10
Owens	<10	<10
Rhodes	10	12.8
Sinclair	<10	<10
Stark	<10	<10
Zane	<10	<10

Incumbent Workers, by College

	All OTN (N)	All OTN (%)
Total[23]	1,550	69.0
Cincinnati	181	71.8
Columbus	89	62.2
Cuyahoga	47	45.6
Eastern Gateway	12	46.2
Lakeland	191	71.3
Lorain	52	36.1
Owens	168	73.4
Rhodes	347	76.6
Sinclair	222	87.1
Stark	147	74.2
Zane	95	53.4

Earnings Increase Post-Enrollment, by College – Incumbent Workers

	All OTN (N)	All OTN (%)
Total	1,025	66.1
Cincinnati	140	77.3
Columbus	55	61.8
Cuyahoga	40	85.1
Eastern Gateway	<10	<10
Lakeland	133	69.6
Lorain	34	65.4
Owens	125	74.4
Rhodes	143	41.2
Sinclair	149	67.1
Stark	116	78.9
Zane	84	88.4

[23] One student enrolled in two OTN colleges.

Program Area Results

College, by Program Area[24]

	CNC & Machining	Digital Fabrication & Industrial Automation	Industrial Maintenance	Occupational Safety	Welding
Total	549	159	711	<10	832
Cincinnati	131	<10	38	<10	103
Columbus	<10	<10	104	<10	44
Cuyahoga	<10	<10	<10	<10	101
Eastern Gateway	<10	<10	<10	<10	26
Lakeland	<10	<10	<10	<10	268
Lorain	32	35	47	<10	35
Owens	23	<10	22	<10	125
Rhodes	<10	124	289	<10	41
Sinclair	165	<10	97	<10	<10
Stark	198	<10	<10	<10	17
Zane	<10	<10	110	<10	72

Student Characteristics, by Program Area

	CNC & Machining	Digital Fabrication & Industrial Automation	Industrial Maintenance	Occupational Safety	Welding
Total	549	159	711	<10	832
Age	30.3	37.5	30.2	<10	28.1
Male	488	140	628	<10	739
White	401	139	485	<10	517
Black	48	<10	71	<10	154
Hispanic	<10	<10	11	<10	15
Other	18	<10	20	<10	30
More than one	<10	<10	10	<10	29
Incumbent	401	139	485	<10	517
Veteran	36	17	26	<10	42
Disabled	22	<10	11	<10	28
Pell Eligible	146	24	118	<10	183
TAA Eligible	21	<10	24	<10	13
Full Time	247	40	247	<10	267
Part Time	291	43	196	<10	484

[24] Students may be counted in multiple program areas.

Program Completers, by Program Area

	All OTN (N)	All OTN (%)
Total	1,033	46.0
CNC & Machining	222	40.4
Digital Fabrication & Industrial	144	90.6
Industrial Maintenance	244	34.3
Occupational Safety	<10	<10
Welding	456	54.8

Non-Incumbent Completers, by Program Area

	All OTN (N)	All OTN (%)
Total	310	13.8
CNC & Machining	59	10.7
Digital Fabrication & Industrial	18	11.3
Industrial Maintenance	108	15.2
Occupational Safety	<10	<10
Welding	135	16.2

Retained in Program, by Program Area

	All OTN (N)	All OTN (%)
Total Retained in Program	341	15.2
CNC & Machining	129	23.5
Digital Fabrication & Industrial	<10	<10
Industrial Maintenance	142	20.0
Occupational Safety	<10	<10
Welding	88	10.6

Retained in Other Program, by Program Area

	All OTN (N)	All OTN (%)
Total	110	4.9
CNC & Machining	42	7.7
Digital Fabrication & Industrial	<10	<10
Industrial Maintenance	23	3.2
Occupational Safety	<10	<10
Welding	22	2.6

Continued in Further Education, by Program Area – Completers

	All OTN (N)	All OTN (%)
Total	157	15.2
CNC & Machining	37	16.7
Digital Fabrication & Industrial	19	13.2
Industrial Maintenance	51	20.9
Occupational Safety	<10	<10
Welding	70	15.4

Students Earning Any Credential, by Program Area

	All OTN (N)	All OTN (%)
Total	1,040	46.3
CNC & Machining	202	36.8
Digital Fabrication & Industrial	143	89.9
Industrial Maintenance	232	32.6
Occupational Safety	<10	<10
Welding	492	59.1

Total Credentials Earned, by Program Area

	All OTN (N)	All OTN (mean per person)
Total	1,990	1.9
CNC & Machining	331	1.6
Digital Fabrication & Industrial	199	1.4
Industrial Maintenance	360	1.6
Occupational Safety	<10	<10
Welding	1,160	2.4

Students Earning Certificates (<1yr), by Program Area

	All OTN (N)	All OTN (%)
Total	1,004	44.7
CNC & Machining	194	35.3
Digital Fabrication & Industrial	139	87.4
Industrial Maintenance	218	30.7
Occupational Safety	<10	<10
Welding	483	58.1

Students Earning Other Certificates/Degrees, by Program Area

	All OTN (N)	All OTN (%)
Total	70	3.1
CNC & Machining	19	3.5
Digital Fabrication & Industrial	<10	<10
Industrial Maintenance	19	2.7
Occupational Safety	<10	<10
Welding	25	3.0

Students Completing Grant Affected Credit Hours, by Program Area

	All OTN (N)	All OTN (%)
Total	1,523	67.8
CNC & Machining	446	81.2
Digital Fabrication & Industrial	58	36.5
Industrial Maintenance	431	60.6
Occupational Safety	<10	<10
Welding	591	71.0

Grant Affected Credit Hours Earned, by Program Area

	All OTN (N)	All OTN (mean)
Total	6,777	4.4
CNC & Machining	2,099	4.7
Digital Fabrication & Industrial	349	6.0
Industrial Maintenance	1906.5	4.4
Occupational Safety	<10	<10
Welding	2,559.5	4.3

Employed First Quarter Post-Completion, by Program Area – Non-Incumbent Completers

	All OTN (N)	All OTN (%)
Total	107	34.5
CNC & Machining	25	42.4
Digital Fabrication & Industrial	<10	<10
Industrial Maintenance	25	23.1
Occupational Safety	<10	<10
Welding	54	40.0

Employed 3 Consecutive Quarters Post-Completion, by Program Area – Non-Incumbent Completers

	All OTN (N)	All OTN (%)
Total	73	23.5
CNC & Machining	18	30.5
Digital Fabrication & Industrial	<10	<10
Industrial Maintenance	19	17.6
Occupational Safety	<10	<10
Welding	32	23.7

Incumbent Workers, by Program Area

	All OTN (N)	All OTN (%)
Total	1,550[25]	69.0
CNC & Machining	401	73.0
Digital Fabrication & Industrial	139	87.4
Industrial Maintenance	485	68.2
Occupational Safety	<10	<10
Welding	517	62.1

Earnings Increase, by Program Area – Incumbent Workers

	All OTN (N)	All OTN (%)
Total	1,025	66.1
CNC & Machining	288	71.8
Digital Fabrication & Industrial	45	32.4
Industrial Maintenance	314	64.7
Occupational Safety	<10	<10
Welding	369	71.4

[25] One student enrolled in two OTN colleges.

Competency Based Education (CBE) Program Results

Student Characteristics, by CBE

	CBE Program Participants (N)	CBE Program Participants (%)
Total	104	100.0
Age	104	29.5 (mean)
Male	90	86.5
White	75	72.1
Black	22	21.2
Hispanic	<10	<10
Other	<10	<10
More than one race	<10	<10
Incumbent Worker	40	38.5
Veteran	<10	<10
Disabled	<10	<10
Pell Eligible	34	32.7
TAA Eligible	<10	<10
Full Time Enrollment	49	47.1
Part Time Enrollment	34	32.7

Outcomes, CBE Program Participants

	CBE Program Participants (N)	CBE Program Participants (%)
Total	104	100.0
Completers	41	39.4
Non-Incumbent Completers	25	24.0
Retained in Program	15	14.4
Retained in Other Program	<10	<10
Employed First Quarter Post-Completion	10	9.6[26]
Employed 3 Consecutive Quarters Post-	<10	<10
Continued in Further Education	10	9.6[27]
Earnings Increase Post-Enrollment	33	31.7[28]
Students Earning Any Credential	38	36.5
Total Credentials Earned	71	1.9 (mean)
Students Earning Certificates (<1yr)	38	36.5
Students Earning Other Certificates/Degrees[29]	<10	<10
Number Completing Grant Affected Credit Hours	57	54.8
Number of Grant Affected Credit Hours	452	7.9 (mean)

[26] 40.0% of non-incumbent completers
[27] 24.4% of completers
[28] 82.5% of incumbent workers
[29] Combined categories due to small cell sizes

Ohio TechNet Subject Codes[30]

2-digit CIP	6-digit CIP	2-digit CIP	6-digit CIP	2-digit CIP	6-digit CIP
01	011099	15	150000	32	320107
14	140101	15	150101	41	410303
14	140401	15	150303	46	460301
14	140702	15	150304	46	460302
14	140802	15	150401	46	460303
14	141003	15	150403	46	460401
14	141004	15	150405	46	460503
14	141101	15	150406	47	470302
14	141201	15	150499	47	470303
14	141301	15	150501	47	470600
14	142401	15	150503	47	470617
14	142701	15	150505	47	470618
14	143301	15	150599	48	480501
14	143401	15	150601	48	480503
14	143601	15	150607	48	480506
14	143801	15	150611	48	480507
14	143901	15	150612	48	480508
14	144001	15	150613	48	480509
14	144101	15	150614	48	480510
14	144201	15	150615	48	480511
14	144301	15	150699	48	480801
14	144401	15	150701	49	490208
14	144501	15	150703	50	500709
14	149999	15	150805	51	510916
		15	150899	51	512202
		15	150901	51	512206
		15	151103	51	512312
		15	151203	52	520205
		15	151301		
		15	151302		
		15	151399		
		15	151501		
		15	151502		
		15	151503		
		15	151601		

[30] The National Center for Education Statistics Classification of Instructional Programs (CIP)

OHIO TECHNET

EMPLOYMENT AND EARNINGS RESULTS SCORECARD

NOTE: Outcome definitions differ from those reported on the Annual Performance Report.

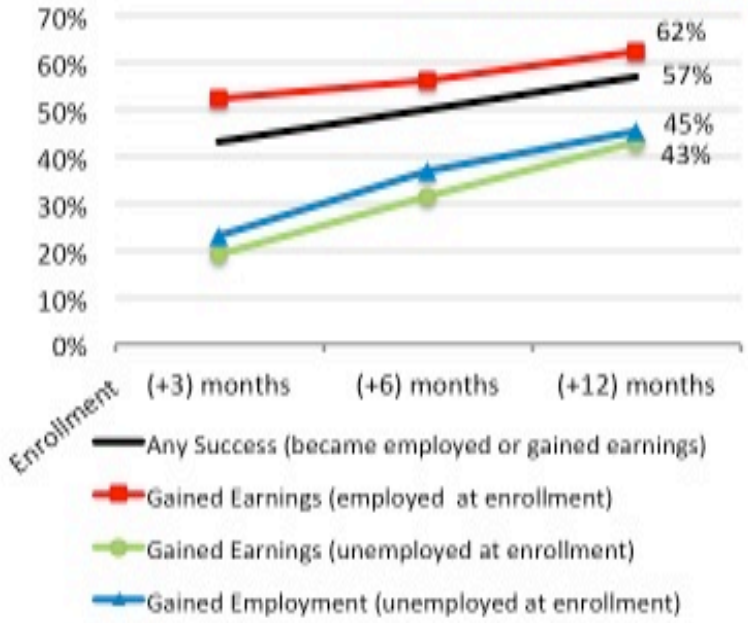
OhioTechNet

OhioHigherEd

PARTICIPANT ANALYSIS: 1,288 PARTICIPANTS INCLUDED

Participant Success 12 Months After Enrollment

(Data Available through March 31, 2018)



- 57% of all participants became employed or experienced an earnings increase.
- 62% of participants employed at enrollment experienced an earnings increase, compared to earnings three months before enrollment.
- 45% of participants unemployed at enrollment became employed.
- 43% of participants unemployed at enrollment experienced an earnings increase, compared to earnings three months before enrollment.
- Success rates will likely increase as individuals continue to transition from school into fully engaged employment.

Participant Earnings Growth 12 Months After Enrollment

(Data Available through March 31, 2018)

Compared to earnings three months before enrollment:

- Overall, participant earnings increased by 25%.
  ($23,500/yr on average at start)
- Participants unemployed at enrollment:
  $8,300/yr → $19,000/yr
  (Average earnings increase)
- Participants employed at enrollment:
  $25,600/yr → $32,500/yr
  (Average earnings increase)
- Earnings will likely increase as individuals continue to transition from school into fully engaged employment.

OHIO TECHNET

EMPLOYMENT AND EARNINGS RESULTS SCORECARD

OhioTechNet

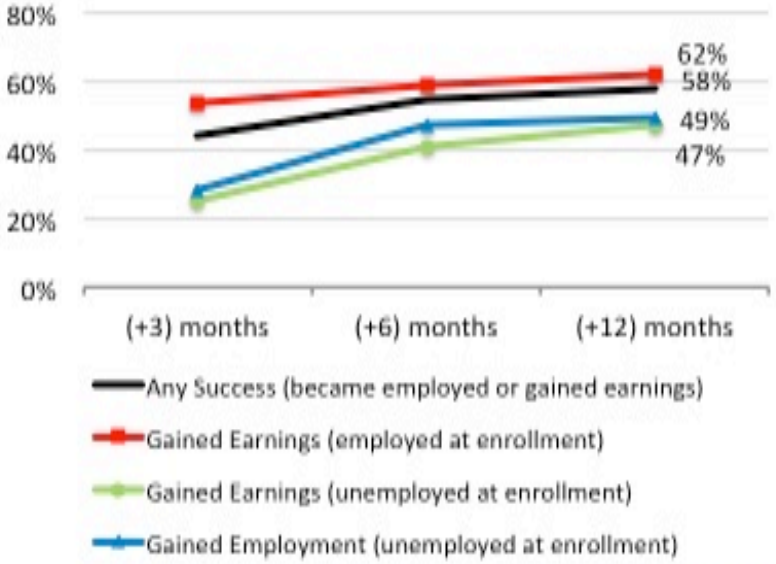
OhioHigherEd

NOTE: Outcome definitions differ from those reported on the Annual Performance Report.

COMPLETER ANALYSIS: 485 COMPLETERS INCLUDED

Participant Success 12 Months After Completion

(Data Available through March 31, 2018)



- 58% of all completers became employed or experienced an earnings increase.
- 62% of completers employed at enrollment experienced an earnings increase.
- 49% of completers unemployed at enrollment became employed.
- 47% of completers unemployed at enrollment experienced an earnings increase.
- Success rates will likely increase as individuals continue to transition from school into fully engaged employment.

Participant Earnings Growth 12 Months After Completion

(Data Available through March 31, 2018)

Compared to earnings three months before enrollment:

- Overall, earnings of completers increased by 39%.
  ($24,800/yr on average at start)
- Completers unemployed at enrollment:
  $9,800/yr → $25,000/yr
  (Average earnings increase)
- Completers employed at enrollment:
  $26,800/yr → $37,400/yr
  (Average earnings increase)
- Earnings will likely increase as individuals continue to transition from school into fully engaged employment.

Most Common Participant Occupations: Self-reported via Survey

- Welder (12% of respondents)
- Technician (5% of respondents)
- Machinist (5% of respondents)

Appendix E: Analysis of Post-Completion Survey Export Through Summer 2018

Introduction

Surveys were administered to Ohio TechNet participants who completed a grant program during the grant period. Responses were received between November 2016 and July 2018. The goal is to gain information about the post-completion employment of participants and changes in employment from before enrollment in an Ohio TechNet grant-affected program.

The analysis below is comprehensive but may not be exhaustive. Some items from the full survey may not receive treatment below because they lacked enough clear response to report. Extensions to this work can be completed if there is a reason to pull additional items into the analysis as the survey gains more responses.

Survey Responses

In total, there were 511 responses to the survey that were submitted for analysis. However, many responses were removed from the analysis. The two primary reasons for removal were that a respondent indicated they were not a completer or responses were substantially incomplete beyond the initial survey page. In addition, multiple responses from a single respondent have been removed, leaving only the most recent or most complete survey for analysis per person. After these exclusions, there are 279 survey responses. The count of survey responses by college:

College	Number of Survey Responses
Cincinnati State Technical and Community College	24
Columbus State Community College	0
Cuyahoga Community College	11
Eastern Gateway Community College	1
Lakeland Community College	60
Lorain County Community College	29
Owens Community College	27
Rhodes State College	60
Sinclair Community College	41
Stark State College	15
Zane State College	11
Total	279

Consortium

The responses for survey questions about individuals' employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	120 (43)
No	149 (53)
Missing	10 (4)
For the 120 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	
Yes	102 (85)
No	17 (14)
Missing	1 (1)
For the 149 "No" plus 17 "Yes then No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	96 (58)
Never been employed prior to enrollment	2 (1)
Unemployed for at least 1 year	17 (10)
Unemployed for less than 1 year	24 (14)
Missing	27 (16)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	38 (14)
1 year to 10 years	127 (46)
10 years or more	44 (16)
Missing or uninterpretable response	70 (25)
What was your hourly wage in that job?	
Less than $12/hour	41 (15)
$12/hour to $20/hour	73 (26)
$20/hour or more	70 (25)
Missing or uninterpretable response	95 (34)
How many hours did you work per week, on average, in that job?	
Less than 40	41 (15)
40 or more	186 (67)
Missing or uninterpretable response	52 (19)
Did you have paid time off in that job?	
Yes	162 (58)
No	63 (23)
Missing	54 (19)

Did you have healthcare benefits available to you in that job?	
Yes	171 (61)
No	55 (20)
Missing	53 (19)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	202 (72)
No	57 (20)
Missing	20 (7)
For the 202 "Yes" responses above: Was that job in your field of study?	
Yes	
No	118 (58)
Missing	84 (42)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	28 (10)
No	231 (83)
Missing	20 (7)
Did you use your college's career services center in your job search?	
Yes	51 (18)
No	208 (75)
Missing	20 (7)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	117 (42)
No	142 (51)
Missing	20 (7)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	58 (21)
No	201 (72)
Missing	20 (7)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	219 (78)
No	40 (14)
Missing	20 (7)
For the 219 "Yes" responses above: Are you working the same job you had	

prior to, or while enrolled in the program?	
Yes	152 (69)
No	67 (31)
Missing	0 (0)
For the 67 "No" responses above: Would you consider your current job a career advancement?	
Yes	47 (70)
No	20 (30)
Missing	0 (0)
For the 67 "No" responses above: Are you currently working for a company in your field of study?	
Yes	46 (69)
No	21 (31)
Missing	0 (0)
For the 67 "No" responses above: What is your hourly wage at your current job?	
Less than $12/hour	10 (15)
$12/hour to $20/hour	35 (52)
$20/hour or more	15 (22)
Missing or uninterpretable response	7 (10)
For the 67 "No" responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	10 (15)
40 or more	57 (85)
Missing or uninterpretable response	0 (0)
For the 67 "No" responses above: Do you have paid time off at your current job?	
Yes	41 (61)
No	26 (39)
Missing	0 (0)
For the 67 "No" responses above: Do you have healthcare benefits available to you in your current job?	
Yes	48 (72)
No	18 (27)
Missing	1 (1)

The responses for survey questions about individuals' opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	219 (78)
No	39 (14)
Missing	21 (8)
Would you recommend your recently completed program to someone else	

considering a career in your field of study?	
Yes	243 (87)
No	15 (5)
Missing	21 (8)

Cincinnati State Technical and Community College

24 survey responses as of this analysis period.

The responses for survey questions about individuals' employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	
No	7 (29)
Missing	15 (63)
	2 (8)
For the 7 "Yes" response above: Were you working in this job immediately before enrolling in the program?	
Yes	6 (86)
No	1 (14)
For the 15 "No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	12 (80)
Never been employed prior to enrollment	1 (7)
Unemployed for at least 1 year	0 (0)
Unemployed for less than 1 year	2 (13)
Missing	0 (0)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	3 (13)
1 year to 10 years	13 (54)
10 years or more	2 (8)
Missing or uninterpretable response	6 (25)
What was your hourly wage in that job?	
Less than $12/hour	4 (17)
$12/hour to $20/hour	8 (33)
$20/hour or more	5 (21)
Missing or uninterpretable response	7 (29)
How many hours did you work per week, on average, in that job?	

Less than 40	4 (17)
40 or more	14 (58)
Missing or uninterpretable response	6 (25)
Did you have paid time off in that job?	
Yes	15 (63)
No	3 (13)
Missing	6 (25)
Did you have healthcare benefits available to you in that job?	
Yes	16 (67)
No	2 (8)
Missing	6 (25)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	20 (83)
No	2 (8)
Missing	2 (8)
For the 20 "Yes" responses above: Was that job in your recent field of study?	
Yes	
No	11 (55)
Missing	9 (45)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	3 (13)
No	19 (79)
Missing	2 (8)
Did you use your college's career services center in your job search?	
Yes	4 (17)
No	18 (75)
Missing	2 (8)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	11 (46)
No	11 (46)
Missing	2 (8)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	4 (17)
No	18 (75)
Missing	2 (8)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	19 (79)
No	3 (13)
Missing	2 (8)
For the 19 "Yes" responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	14 (74)
No	5 (26)
Missing	0 (0)
For the 5 "No" responses above: Would you consider your current job a career advancement?	
Yes	4 (80)
No	1 (20)
Missing	0 (0)
For the 5 "No" responses above: Are you currently working for a company in your field of study?	
Yes	3 (60)
No	2 (40)
Missing	0 (0)
For the 5 "No" responses above: What is your hourly wage at your current job?	
Less than $12/hour	
$12/hour to $20/hour	0 (0)
$20/hour or more	5 (100)
Missing or uninterpretable response	0 (0)
	0 (0)
For the 5 "No" responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	0 (0)
40 or more	5 (100)
Missing or uninterpretable response	0 (0)
For the 5 "No" responses above: Do you have paid time off at your current job?	
Yes	
No	3 (60)
Missing	2 (40)
	0 (0)
For the 5 "No" responses above: Do you have healthcare benefits available to you in your current job?	
Yes	4 (80)
No	1 (20)
Missing	0 (0)

The responses for survey questions about individuals' opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	18 (75)
No	4 (17)
Missing	2 (8)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	21 (88)
No	1 (4)
Missing	2 (8)

Columbus State Community College

No survey responses as of this analysis period.

Cuyahoga Community College

11 survey responses as of this analysis period.

The responses for survey questions about individuals' employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	
No	6 (55)
Missing	4 (36)
	1 (9)
For the 6 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	
Yes	5 (83)
No	1 (17)
For the 4 "No" plus 1 "Yes then No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	1 (20)
Unemployed for at least 1 year	2 (40)
Unemployed for less than 1 year	2 (40)
Missing	0 (0)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)

How long did you work in that position?	
Less than 1 year	4 (36)
1 year to 10 years	4 (36)
10 years or more	2 (18)
Missing or uninterpretable response	1 (9)
What was your hourly wage in that job?	
Less than $12/hour	1 (9)
$12/hour to $20/hour	4 (36)
$20/hour or more	4 (36)
Missing or uninterpretable response	2 (18)
How many hours did you work per week, on average, in that job?	
Less than 40	0 (0)
40 or more	10 (91)
Missing or uninterpretable response	1 (9)
Did you have paid time off in that job?	
Yes	5 (45)
No	5 (45)
Missing	1 (9)
Did you have healthcare benefits available to you in that job?	
Yes	6 (55)
No	4 (36)
Missing	1 (9)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	7 (64)
No	3 (27)
Missing	1 (9)
For the 7 “Yes” responses above: Was that job in your recent field of study?	
Yes	
No	7 (100)
Missing	0 (0)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	1 (9)
No	8 (82)
Missing	1 (9)
Did you use your college's career services center in your job search?	
Yes	1 (9)
No	9 (82)
Missing	1 (9)
Did you visit an academic counselor or adviser to select your program or courses?	

Yes	2 (18)
No	8 (73)
Missing	1 (9)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	2 (18)
No	8 (73)
Missing	1 (9)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	7 (64)
No	3 (27)
Missing	1 (9)
For the 7 "Yes" responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	6 (86)
No	1 (14)
Missing	0 (0)
For the 1 "No" responses above: Would you consider your current job a career advancement?	
Yes	1 (100)
No	0 (0)
Missing	0 (0)
For the 1 "No" responses above: Are you currently working for a company in your field of study?	
Yes	1 (100)
No	0 (0)
Missing	0 (0)
For the 1 "No" responses above: What is your hourly wage at your current job?	
Less than $12/hour	0 (0)
$12/hour to $20/hour	1 (100)
$20/hour or more	0 (0)
Missing or uninterpretable response	0 (0)
For the 1 "No" responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	0 (0)
40 or more	1 (100)
Missing or uninterpretable response	0 (0)
For the 1 "No" responses above: Do you have paid time off at your current job?	

Yes	
No	1 (100)
Missing	0 (0)
	0 (0)
For the 1 "No" responses above: Do you have healthcare benefits available to you in your current job?	
Yes	1 (100)
No	0 (0)
Missing	0 (0)

The responses for survey questions about individuals' opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	9 (82)
No	1 (9)
Missing	1 (9)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	10 (91)
No	0 (0)
Missing	1 (9)

Eastern Gateway Community College

1 survey response as of this analysis period. This is too few responses to support a deeper look at survey results.

Lakeland Community College

60 survey responses as of this analysis period.

The responses for survey questions about individuals' employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	
No	16 (27)
Missing	41 (68)
	3 (5)
For the 16 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	

Yes	14 (88)
No	2 (13)
For the 41 “No” plus 2 “Yes then No” responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	25 (58)
Unemployed for at least 1 year	5 (12)
Unemployed for less than 1 year	7 (16)
Missing	6 (14)

The responses for survey questions about individuals’ employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	8 (13)
1 year to 10 years	27 (45)
10 years or more	10 (17)
Missing or uninterpretable response	15 (25)
What was your hourly wage in that job?	
Less than $12/hour	17 (28)
$12/hour to $20/hour	11 (18)
$20/hour or more	15 (25)
Missing or uninterpretable response	17 (28)
How many hours did you work per week, on average, in that job?	
Less than 40	14 (23)
40 or more	36 (60)
Missing or uninterpretable response	10 (17)
Did you have paid time off in that job?	
Yes	32 (53)
No	19 (32)
Missing	9 (15)
Did you have healthcare benefits available to you in that job?	
Yes	31 (52)
No	20 (33)
Missing	9 (15)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	42 (70)
No	10 (17)
Missing	8 (13)
For the 42 “Yes” responses above: Was that job in your recent field of study?	
Yes	
No	23 (55)

Missing	19 (45)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	7 (12)
No	45 (75)
Missing	8 (13)
Did you use your college's career services center in your job search?	
Yes	9 (15)
No	43 (72)
Missing	8 (13)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	28 (47)
No	24 (40)
Missing	8 (13)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	15 (25)
No	37 (62)
Missing	8 (13)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	42 (70)
No	10 (17)
Missing	8 (13)
For the 42 "Yes" responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	32 (76)
No	10 (24)
Missing	0 (0)
For the 10 "No" responses above: Would you consider your current job a career advancement?	
Yes	8 (80)
No	2 (20)
Missing	0 (0)
For the 10 "No" responses above: Are you currently working for a company in your field of study?	
Yes	9 (90)
No	1 (10)
Missing	0 (0)

For the 10 “No” responses above: What is your hourly wage at your current job?	
Less than $12/hour	1 (10)
$12/hour to $20/hour	4 (40)
$20/hour or more	4 (40)
Missing or uninterpretable response	1 (10)
For the 10 “No” responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	0 (0)
40 or more	10 (100)
Missing or uninterpretable response	0 (0)
For the 10 “No” responses above: Do you have paid time off at your current job?	
Yes	7 (70)
No	3 (30)
Missing	0 (0)
For the 10 “No” responses above: Do you have healthcare benefits available to you in your current job?	
Yes	9 (90)
No	1 (10)
Missing	0 (0)

The responses for survey questions about individuals’ opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	44 (73)
No	8 (13)
Missing	8 (13)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	49 (82)
No	3 (5)
Missing	8 (13)

Lorain County Community College

29 survey responses as of this analysis period.

The responses for survey questions about individuals’ employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	

Yes	
No	9 (31)
Missing	19 (66)
	1 (3)
For the 9 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	
Yes	6 (67)
No	2 (22)
Missing	1 (11)
For the 19 "No" plus 2 "Yes then No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	9 (43)
Never been employed prior to enrollment	1 (5)
Unemployed for at least 1 year	4 (19)
Unemployed for less than 1 year	6 (29)
Missing	1 (48)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	2 (7)
1 year to 10 years	11 (38)
10 years or more	9 (31)
Missing or uninterpretable response	7 (24)
What was your hourly wage in that job?	
Less than $12/hour	2 (7)
$12/hour to $20/hour	7 (24)
$20/hour or more	9 (31)
Missing or uninterpretable response	11 (38)
How many hours did you work per week, on average, in that job?	
Less than 40	4 (14)
40 or more	20 (69)
Missing or uninterpretable response	5 (17)
Did you have paid time off in that job?	
Yes	17 (59)
No	6 (21)
Missing	6 (21)
Did you have healthcare benefits available to you in that job?	
Yes	19 (66)
No	4 (14)
Missing	6 (21)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	20 (69)
No	8 (28)
Missing	1 (34)
For the 20 "Yes" responses above: Was that job in your recent field of study?	
Yes	
No	8 (40)
Missing	12 (60)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	2 (7)
No	26 (90)
Missing	1 (3)
Did you use your college's career services center in your job search?	
Yes	7 (24)
No	21 (72)
Missing	1 (3)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	11 (38)
No	17 (59)
Missing	1 (3)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	8 (28)
No	20 (69)
Missing	1 (3)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	25 (86)
No	3 (10)
Missing	1 (3)
For the 25 "Yes" responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	15 (60)
No	10 (40)
Missing	0 (0)
For the 10 "No" responses above: Would you consider your current job a career advancement?	

Yes	7 (70)
No	3 (30)
Missing	0 (0)
For the 10 “No” responses above: Are you currently working for a company in your field of study?	
Yes	7 (70)
No	3 (30)
Missing	0 (0)
For the 10 “No” responses above: What is your hourly wage at your current job?	
Less than $12/hour	2 (20)
$12/hour to $20/hour	3 (30)
$20/hour or more	3 (30)
Missing or uninterpretable response	2 (20)
For the 10 “No” responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	1 (10)
40 or more	9 (90)
Missing or uninterpretable response	0 (0)
For the 10 “No” responses above: Do you have paid time off at your current job?	
Yes	5 (50)
No	5 (50)
Missing	0 (0)
For the 10 “No” responses above: Do you have healthcare benefits available to you in your current job?	
Yes	7 (70)
No	3 (30)
Missing	0 (0)

The responses for survey questions about individuals’ opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	23 (79)
No	4 (14)
Missing	2 (69)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	25 (86)
No	2 (7)
Missing	2 (7)

Owens Community College

27 survey responses as of this analysis period.

The responses for survey questions about individuals' employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	9 (33)
No	17 (63)
Missing	1 (4)
For the 9 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	
Yes	7 (78)
No	2 (22)
For the 10 "No" plus 3 "Yes then No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	15 (79)
Unemployed for at least 1 year	0 (0)
Unemployed for less than 1 year	0 (0)
Missing	4 (21)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	1 (4)
1 year to 10 years	12 (44)
10 years or more	3 (11)
Missing or uninterpretable response	11 (41)
What was your hourly wage in that job?	
Less than $12/hour	3 (11)
$12/hour to $20/hour	5 (19)
$20/hour or more	6 (22)
Missing or uninterpretable response	13 (48)
How many hours did you work per week, on average, in that job?	
Less than 40	5 (19)
40 or more	14 (52)
Missing or uninterpretable response	8 (30)
Did you have paid time off in that job?	
Yes	14 (52)
No	5 (19)
Missing	8 (30)

Did you have healthcare benefits available to you in that job?	
Yes	14 (52)
No	5 (19)
Missing	8 (30)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	18 (67)
No	9 (33)
Missing	0 (0)
For the 18 "Yes" responses above: Was that job in your recent field of study?	
Yes	
No	12 (67)
Missing	6 (33)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	2 (7)
No	25 (93)
Missing	0 (0)
Did you use your college's career services center in your job search?	
Yes	8 (30)
No	19 (70)
Missing	0 (0)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	13 (48)
No	14 (52)
Missing	0 (0)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	7 (26)
No	20 (74)
Missing	0 (0)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	21 (78)
No	6 (22)
Missing	0 (0)
For the 21 "Yes" responses above: Are you working the same job you had prior	

to, or while enrolled in the program?	
Yes	15 (71)
No	6 (29)
Missing	0 (0)
For the 6 "No" responses above: Would you consider your current job a career advancement?	
Yes	5 (83)
No	1 (17)
Missing	0 (0)
For the 6 "No" responses above: Are you currently working for a company in your field of study?	
Yes	4 (67)
No	2 (33)
Missing	0 (0)
For the 6 "No" responses above: What is your hourly wage at your current job?	
Less than $12/hour	
$12/hour to $20/hour	0 (0)
$20/hour or more	4 (67)
Missing or uninterpretable response	1 (17)
	1 (17)
For the 6 "No" responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	3 (50)
40 or more	3 (50)
Missing or uninterpretable response	0 (0)
For the 6 "No" responses above: Do you have paid time off at your current job?	
Yes	
No	3 (50)
Missing	3 (50)
	0 (0)
For the 6 "No" responses above: Do you have healthcare benefits available to you in your current job?	
Yes	3 (50)
No	3 (50)
Missing	0 (0)

The responses for survey questions about individuals' opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	24 (89)
No	3 (11)
Missing	0 (0)
Would you recommend your recently completed program to someone else	

considering a career in your field of study?	
Yes	25 (93)
No	2 (7)
Missing	0 (0)

Rhodes State College

60 survey responses as of this analysis period.

The responses for survey questions about individuals' employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	37 (62)
No	22 (37)
Missing	1 (2)
For the 37 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	
Yes	33 (89)
No	4 (11)
For the 22 "No" plus 4 "Yes then No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	10 (38)
Unemployed for at least 1 year	2 (8)
Unemployed for less than 1 year	4 (15)
Missing	10 (38)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	7 (12)
1 year to 10 years	24 (40)
10 years or more	10 (17)
Missing or uninterpretable response	19 (32)
What was your hourly wage in that job?	
Less than $12/hour	5 (8)
$12/hour to $20/hour	12 (20)
$20/hour or more	15 (25)
Missing or uninterpretable response	28 (47)
How many hours did you work per week, on average, in that job?	
Less than 40	7 (12)

40 or more	39 (65)
Missing or uninterpretable response	14 (23)
Did you have paid time off in that job?	
Yes	36 (60)
No	8 (13)
Missing	16 (27)
Did you have healthcare benefits available to you in that job?	
Yes	37 (62)
No	8 (13)
Missing	15 (25)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	45 (75)
No	11 (18)
Missing	4 (7)
For the 45 "Yes" responses above: Was that job in your recent field of study?	
Yes	
No	29 (64)
Missing	16 (36)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	3 (5)
No	53 (88)
Missing	4 (7)
Did you use your college's career services center in your job search?	
Yes	9 (15)
No	47 (78)
Missing	4 (7)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	23 (38)
No	33 (55)
Missing	4 (7)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	8 (13)
No	48 (80)
Missing	4 (7)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	50 (83)
No	6 (10)
Missing	4 (7)
For the 50 "Yes" responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	34 (68)
No	16 (32)
Missing	0 (0)
For the 16 "No" responses above: Would you consider your current job a career advancement?	
Yes	10 (63)
No	6 (38)
Missing	0 (0)
For the 16 "No" responses above: Are you currently working for a company in your field of study?	
Yes	8 (50)
No	8 (50)
Missing	0 (0)
For the 16 "No" responses above: What is your hourly wage at your current job?	
Less than $12/hour	3 (19)
$12/hour to $20/hour	8 (50)
$20/hour or more	2 (13)
Missing or uninterpretable response	3 (19)
For the 16 "No" responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	4 (25)
40 or more	12 (75)
Missing or uninterpretable response	0 (0)
For the 16 "No" responses above: Do you have paid time off at your current job?	
Yes	13 (81)
No	3 (19)
Missing	0 (0)
For the 16 "No" responses above: Do you have healthcare benefits available to you in your current job?	

Yes	13 (81)
No	2 (13)
Missing	1 (6)

The responses for survey questions about individuals' opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	47 (78)
No	9 (15)
Missing	4 (7)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	54 (90)
No	2 (3)
Missing	4 (7)

Sinclair Community College

41 survey responses as of this analysis period.

The responses for survey questions about individuals' employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	
No	26 (63)
Missing	14 (34)
	1 (2)
For the 26 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	
Yes	23 (88)
No	3 (12)
For the 14 "No" plus 3 "Yes then No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	11 (65)
Unemployed for at least 1 year	1 (6)
Unemployed for less than 1 year	3 (18)
Missing	2 (12)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	5 (12)
1 year to 10 years	26 (63)
10 years or more	3 (7)
Missing or uninterpretable response	7 (17)
What was your hourly wage in that job?	
Less than $12/hour	0 (0)
$12/hour to $20/hour	15 (37)
$20/hour or more	13 (32)
Missing or uninterpretable response	13 (32)
How many hours did you work per week, on average, in that job?	
Less than 40	2 (5)
40 or more	35 (85)
Missing or uninterpretable response	4 (10)
Did you have paid time off in that job?	
Yes	30 (73)
No	6 (15)
Missing	5 (12)
Did you have healthcare benefits available to you in that job?	
Yes	31 (76)
No	5 (12)
Missing	5 (12)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	28 (68)
No	10 (24)
Missing	3 (7)
For the 28 “Yes” responses above: Was that job in your recent field of study?	
Yes	
No	14 (50)
Missing	14 (50)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	4 (10)
No	34 (83)
Missing	3 (7)
Did you use your college's career services center in your job search?	
Yes	9 (22)
No	29 (71)
Missing	3 (7)
Did you visit an academic counselor or adviser to select your program or	

courses?	
Yes	19 (46)
No	19 (46)
Missing	3 (7)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	8 (20)
No	30 (73)
Missing	3 (7)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	32 (78)
No	6 (15)
Missing	3 (7)
For the 32 "Yes" responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	18 (56)
No	14 (44)
Missing	0 (0)
For the 14 "No" response above: Would you consider your current job a career advancement?	
Yes	7 (50)
No	7 (50)
Missing	0 (0)
For the 14 "No" response above: Are you currently working for a company in your field of study?	
Yes	9 (64)
No	5 (36)
Missing	0 (0)
For the 14 "No" response above: What is your hourly wage at your current job?	
Less than $12/hour	3 (21)
$12/hour to $20/hour	8 (57)
$20/hour or more	3 (21)
Missing or uninterpretable response	0 (0)
For the 14 "No" response above: How many hours do you work per week, on average, at your current job?	
Less than 40	2 (14)
40 or more	12 (86)
Missing or uninterpretable response	0 (0)

For the 14 “No” response above: Do you have paid time off at your current job?	
Yes	
No	5 (36)
Missing	9 (64)
	0 (0)
For the 14 “No” response above: Do you have healthcare benefits available to you in your current job?	
Yes	8 (57)
No	6 (43)
Missing	0 (0)

The responses for survey questions about individuals’ opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	33 (80)
No	5 (12)
Missing	3 (7)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	35 (85)
No	3 (7)
Missing	3 (7)

Stark State College

15 survey responses as of this analysis period.

The responses for survey questions about individuals’ employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	
No	9 (60)
Missing	6 (40)
	0 (0)
For the 9 “Yes” responses above: Were you working in this job immediately before enrolling in the program?	
Yes	7 (78)
No	2 (22)
For the 6 “No” plus 2 “Yes then No” responses above: Which of the following best describes your situation prior to enrollment?	

Employed in a job unrelated to my field of study	5 (63)
Unemployed for at least 1 year	3 (38)
Unemployed for less than 1 year	0 (0)
Missing	0 (0)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	6 (40)
1 year to 10 years	5 (33)
10 years or more	4 (27)
Missing or uninterpretable response	0 (0)
What was your hourly wage in that job?	
Less than $12/hour	5 (33)
$12/hour to $20/hour	6 (40)
$20/hour or more	3 (20)
Missing or uninterpretable response	1 (7)
How many hours did you work per week, on average, in that job?	
Less than 40	2 (13)
40 or more	12 (80)
Missing or uninterpretable response	1 (7)
Did you have paid time off in that job?	
Yes	8 (53)
No	7 (47)
Missing	0 (0)
Did you have healthcare benefits available to you in that job?	
Yes	12 (80)
No	3 (20)
Missing	0 (0)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	11 (73)
No	4 (27)
Missing	0 (0)
For the 11 "Yes" responses above: Was that job in your recent field of study?	
Yes	
No	5 (45)
Missing	6 (55)
	0 (0)
Did you participate in an internship as part of your program?	
Yes	3 (20)

No	12 (80)
Missing	0 (0)
Did you use your college's career services center in your job search?	
Yes	2 (13)
No	13 (87)
Missing	0 (0)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	6 (40)
No	9 (60)
Missing	0 (0)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	3 (20)
No	12 (80)
Missing	0 (0)

The responses for survey questions about individuals' employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	12 (80)
No	3 (20)
Missing	0 (0)
For the 12 "Yes" responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	9 (75)
No	3 (25)
Missing	0 (0)
For the 3 "No" responses above: Would you consider your current job a career advancement?	
Yes	3 (100)
No	0 (0)
Missing	0 (0)
For the 3 "No" responses above: Are you currently working for a company in your field of study?	
Yes	3 (100)
No	0 (0)
Missing	0 (0)
For the 3 "No" responses above: What is your hourly wage at your current job?	
Less than $12/hour	
$12/hour to $20/hour	0 (0)

$20/hour or more	2 (67)
Missing or uninterpretable response	1 (33)
	0 (0)
For the 3 “No” responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	0 (0)
40 or more	3 (100)
Missing or uninterpretable response	0 (0)
For the 3 “No” responses above: Do you have paid time off at your current job?	
Yes	
No	2 (67)
Missing	1 (33)
	0 (0)
For the 3 “No” responses above: Do you have healthcare benefits available to you in your current job?	
Yes	2 (67)
No	1 (33)
Missing	0 (0)

The responses for survey questions about individuals’ opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	12 (80)
No	3 (20)
Missing	0 (0)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	13 (87)
No	2 (13)
Missing	0 (0)

Zane State College

11 survey responses as of this analysis period.

The responses for survey questions about individuals’ employment situation with respect to their field of study before enrolling in their TAACCCT program:

Question/Response	Number (%)
Prior to enrollment, had you ever, at any time, had a job in your field of study?	
Yes	
No	1 (9)
Missing	10 (91)

	0 (0)
For the 1 "Yes" responses above: Were you working in this job immediately before enrolling in the program?	
Yes	1 (100)
No	0 (0)
For the 10 "No" plus 0 "Yes then No" responses above: Which of the following best describes your situation prior to enrollment?	
Employed in a job unrelated to my field of study	7 (70)
Unemployed for at least 1 year	0 (0)
Unemployed for less than 1 year	0 (0)
Missing	3 (30)

The responses for survey questions about individuals' employment in the job they had immediately before enrolling in their TAACCCT program:

Question/Response	Number (%)
How long did you work in that position?	
Less than 1 year	2 (18)
1 year to 10 years	4 (36)
10 years or more	1 (9)
Missing or uninterpretable response	4 (36)
What was your hourly wage in that job?	
Less than $12/hour	3 (27)
$12/hour to $20/hour	5 (45)
$20/hour or more	0 (0)
Missing or uninterpretable response	3 (27)
How many hours did you work per week, on average, in that job?	
Less than 40	2 (18)
40 or more	6 (55)
Missing or uninterpretable response	3 (27)
Did you have paid time off in that job?	
Yes	5 (45)
No	3 (27)
Missing	3 (27)
Did you have healthcare benefits available to you in that job?	
Yes	5 (45)
No	3 (27)
Missing	3 (27)

The responses for survey questions about individuals during their TAACCCT program:

Question/Response	Number (%)
Were you employed while enrolled in the program?	
Yes	10 (91)
No	0 (0)
Missing	1 (9)

For the 10 “Yes” responses above: Was that job in your recent field of study?	
Yes	8 (80)
No	2 (20)
Missing	0 (0)
Did you participate in an internship as part of your program?	
Yes	3 (27)
No	7 (64)
Missing	1 (9)
Did you use your college's career services center in your job search?	
Yes	2 (18)
No	8 (73)
Missing	1 (9)
Did you visit an academic counselor or adviser to select your program or courses?	
Yes	4 (36)
No	6 (55)
Missing	1 (9)
Did you receive college credit in the program for prior work or life experience, such as receiving college credit via a test or documentation of previous training?	
Yes	2 (18)
No	8 (73)
Missing	1 (9)

The responses for survey questions about individuals’ employment since completing their TAACCCT program:

Question/Response	Number (%)
Are you currently working?	
Yes	10 (91)
No	0 (0)
Missing	1 (9)
For the 10 “Yes” responses above: Are you working the same job you had prior to, or while enrolled in the program?	
Yes	8 (80)
No	2 (20)
Missing	0 (0)
For the 2 “No” responses above: Would you consider your current job a career advancement?	
Yes	2 (100)
No	0 (0)
Missing	0 (0)
For the 2 “No” responses above: Are you currently working for a company in	

your field of study?	
Yes	2 (100)
No	0 (0)
Missing	0 (0)
For the 2 “No” responses above: What is your hourly wage at your current job?	
Less than $12/hour	
$12/hour to $20/hour	1 (50)
$20/hour or more	0 (0)
Missing or uninterpretable response	1 (50)
	0 (0)
For the 2 “No” responses above: How many hours do you work per week, on average, at your current job?	
Less than 40	0 (0)
40 or more	2 (100)
Missing or uninterpretable response	0 (0)
For the 2 “No” responses above: Do you have paid time off at your current job?	
Yes	
No	2 (100)
Missing	0 (0)
	0 (0)
For the 2 “No” responses above: Do you have healthcare benefits available to you in your current job?	
Yes	1 (50)
No	1 (50)
Missing	0 (0)

The responses for survey questions about individuals’ opinion of the program:

Question/Response	Number (%)
Do you believe that the program you have completed will lead to career advancement in the future?	
Yes	8 (73)
No	2 (18)
Missing	1 (9)
Would you recommend your recently completed program to someone else considering a career in your field of study?	
Yes	10 (91)
No	0 (0)
Missing	1 (9)