Delaware Technical Community College Round 4 TAACCCT Grant Evaluation

Final Report

Report to:
Martha Hofstetter
Principal Investigator
September 14, 2018

Hezel
ASSOCIATES
Research ● Evaluation ● Planning

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

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

EXECUTIVE SUMMARY

Delaware Technical Community College (DTCC) was awarded US Department of Labor (USDOL) funds to create training programs for jobs in high demand in the state, focused on Building Automation Systems (BAS) and Patient Care Technicians (PCT), leveraging partnerships with several local companies and organizations.

Project Description

Through Round 4 Trade Adjustment Assistance Community College and Career Training (TAACCCT) funding, DTCC sought to develop two programs that would increase the education and employability of the local population in high-demand industries. DTCC implemented the BAS Level 1 and 2 Certification program and established the Trane Center of Excellence. Students who complete the BAS certification program receive two stackable certifications and gain hands-on experience training with industry equipment. The design of the BAS certification program was based on an experiential learning model and industry-designed curricula. Students learn skills by working with the new equipment in the Center of Excellence.

Also during this grant cycle, DTCC developed and implemented the PCT program, which prepares students for three certification tests: (a) the National Health Career Association's Certification of Certified Patient Care Technicians, (b) the State of Delaware Nursing Assistant Certification, and (c) the American Society of Phlebotomy Technicians, all of which open up new opportunities for jobs in the healthcare field. Students in the PCT program experience hands-on training in a lab that mimics a hospital setting and by participating in clinical training at local employer sites. The PCT program was based on a stackable credential program model, allowing students to earn credentials throughout the program, increasing their employability even before they complete the program.

Evaluation Design

DTCC partnered with Hezel Associates to provide a formative and summative evaluation of the 4-year grant. The evaluation sought to provide formative feedback to DTCC regarding implementation quality, aimed at informing program improvements. In addition, the evaluation was designed to provide summative feedback regarding outcomes of the program.

Hezel Associates used both qualitative and quantitative methods to address evaluation questions of interest. Questions pertaining to program implementation quality and fidelity (i.e., questions 1–4 and 8) were addressed through a review of project documents, as well as interviews with program staff, employer partners, and program participants.

Project Implementation
1. How was the particular curriculum selected, used, or created?
2. How was the program managed and implemented?
    2.1. How were programs and program design improved or expanded using grant funds?
    2.2. What delivery methods were offered?
    2.3. What was the program administrative structure?
    2.4. What support services and other services were offered?
3. Did the grantees conduct an in-depth assessment of participants' abilities, skills, and

interests to select participants into the grant program?
  - 3.1. What assessment tools and process were used?
  - 3.2. Who conducted the assessment?
  - 3.3. How were the assessment results used?
  - 3.4. Were the assessment results useful in determining the appropriate program and course sequence for participants?
  - 3.5. Was career guidance provided, and if so, through what methods?
4. What contributions did each of the partners make in terms of (a) program design, (b) curriculum development, (c) recruitment, (d) training, (e) placement, (f) program management, (g) leveraging of resources, and (h) commitment to program sustainability?
  - 4.1. What factors contributed to partners' involvement or lack of involvement in the program?
  - 4.2. Which contributions from partners were most critical to the success of the grant program?
  - 4.3. Which contributions from partners had less of an impact?
8. To what extent did project activities result in desired student perceptions?

Evaluation questions pertaining to project outcomes (i.e., questions 5–7) were addressed through quantitative analysis of institutional student data.

Project Outcomes
5. To what extent did the project increase the attainment of certifications, certificates, diplomas, or other recognized credentials?
6. To what extent did project activities increase student retention rates for Trade Adjustment Assistance (TAA)-eligible workers and other adults?
7. To what extent did the project improve employment outcomes (e.g., hiring, wage increases)?

Findings
At the grant level, activities were managed effectively under the Principal Investigator, with Program Managers leading the activities at each program level. Each program leveraged local companies' knowledge and support, and the curricula were developed with extensive employer input. Findings specific to each program are as follows:

BAS
- Both a credit and non-credit option was established for the BAS Level 1 and 2 Certification programs.
- Finding instructors and a Program Manager for the BAS program was a challenge.
- The BAS Level 1 and 2 Certification programs had low enrollment throughout the grant.

PCT
- The PCT curriculum incorporates lab space that replicates the workplace and includes virtual reality training.

- PCT students are provided with career preparation (e.g., résumé assistance, mock interviewing) and various supports to address personal challenges they may have, including homelessness and financial difficulties.
- The PCT program established a strong network of local company partners.
- Enrollment in the PCT program has been strong, with most completing as intended and finding employment.
- PCT students expressed concerns regarding program organization, citing unclear expectations and inconsistent scheduling.
- PCT students found the hands-on training, in labs and during on-site clinicals, the most useful aspect of the program.

Overall, the grant team was successful in developing and implementing the two unique programs, both of which are the only in the state. While the BAS Level 1 and 2 Certification programs did not have substantial enrollment, the curriculum now exists and can be used as needed. The PCT program allowed DTCC to provide students with a new avenue into the healthcare field, and the hands-on emphasis was shown to be beneficial to employers and students.

Hezel Associates offers the following recommendations to DTCC for program improvement and sustainability beyond the grant:
- Gather BAS employer and degree student opinions regarding the Level 1 and 2 certifications, to determine level of awareness and how well these are aligning with current industry and regional needs.
- Continue to prioritize student support services embedded in the PCT program, as they appear to help students with specific needs.
- Review and revisit scheduling consistency and communication of expectations regarding the PCT program to further student success.
- Maintain momentum on cultivating new employer partnerships as well as sustaining existing relationships.
- Solicit feedback from PCT employer partners to better understand any challenges to collaboration with staff and faculty.

TABLE OF CONTENTS

INTRODUCTION

Delaware Technical Community College (DTCC) was awarded a Round 4 Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant, funded by the U.S. Department of Labor (USDOL). Through this grant, DTCC implemented the Building Automation Systems (BAS) Level 1 and 2 Certification program and established the Trane Center of Excellence at the DTCC Dover campus. Students who completed the BAS Level 1 and 2 Certification program (herein referred to as the "BAS program") received two stackable certifications and gained experience training with industry equipment in the Trane Center of Excellence. This program is an extension of the BAS associate degree program implemented through DTCC's TAACCCT Round 3 grant.

In addition, DTCC implemented the Patient Care Technician (PCT) program at their Wilmington and Georgetown campuses (Georgetown implemented the program later in the grant, in January 2017). The PCT program prepared students for three certification tests: (a) the National Health Career Association's Certification of Certified Patient Care Technicians, (b) the State of Delaware Nursing Assistant Certification, and (c) the American Society of Phlebotomy Technicians. The PCT program was developed based on the accelerated nursing program implemented at DTCC through their TAACCCT Round 2 grant and offers successful PCT program participants eligibility for advanced placement into the accelerated nursing program.

DTCC contracted Hezel Associates to provide a formative and summative evaluation of the 4-year grant. To date, the evaluation reports have provided feedback to DTCC regarding implementation quality to inform program improvement. Hezel Associates presents this final, summative report to document implementation fidelity and quality, and student outcomes of the program. The report details the evaluation methods and findings from all 4 years of the grant, and addresses the following evaluation questions:

1. How was the particular curriculum selected, used, or created?
2. How was the program managed and implemented?
   2.1. How were programs and program design improved or expanded using grant funds?
   2.2. What delivery methods were offered?
   2.3. What was the program administrative structure?
   2.4. What support services and other services were offered?
3. Did the grantees conduct an in-depth assessment of participants' abilities, skills, and interests to select participants into the grant program?
   3.1. What assessment tools and process were used?
   3.2. Who conducted the assessment?
   3.3. How were the assessment results used?
   3.4. Were the assessment results useful in determining the appropriate program and course sequence for participants?
   3.5. Was career guidance provided and if so, through what methods?
4. What contributions did each of the partners make in terms of (a) program design, (b) curriculum development, (c) recruitment, (d) training, (e) placement, (f) program management, (g) leveraging of resources, and (h) commitment to program sustainability?

4.1. What factors contributed to partners' involvement or lack of involvement in the program?

4.2. Which contributions from partners were most critical to the success of the grant program?

4.3. Which contributions from partners had less of an impact?

5. To what extent did the project increase the attainment of certifications, certificates, diplomas, or other recognized credentials?

6. To what extent did project activities increase student retention rates for Trade Adjustment Assistance (TAA)-eligible workers and other adults?

7. To what extent did the project improve employment outcomes (e.g., hiring, wage increases)?

8. To what extent did project activities result in desired student perceptions?

METHODS SUMMARY

Hezel Associates used both qualitative and quantitative methods to address the evaluation questions. Evaluation questions pertaining to program implementation quality and fidelity (i.e., questions 1–4 and 8) were addressed through a review of project documents, as well as interviews with program staff, employer partners, and program participants. Evaluation questions pertaining to program outcomes (i.e., questions 5–7) were addressed through quantitative analysis of institutional student data. A detailed description of the data collection and analysis processes applied throughout the evaluation is included as Appendix A. Final versions of each instrument are included in the appendices as well (i.e., Appendix B–F).

FINDINGS

The findings included in this report are based on data collected throughout the 4-year grant period and are presented by evaluation question.

Evaluation Question 1: Curriculum

BAS and PCT program staff worked with resources internal and external to DTCC to develop curricula. The curriculum development processes for each program are described in the following sections.

BAS

The BAS certification curriculum was developed by Trane, a global company specializing in heating, ventilating, and air conditioning (HVAC) and BAS, and the National Coalition of Certification Centers (NC3). DTCC selected this curriculum due to its success at other institutions and because it was based on evidence that experiential learning is beneficial for students. According to project staff, the director of a DTCC labor market study group attended a conference and witnessed a presentation given by NC3. The director brought some of the ideas delivered in the NC3 presentation to a group at DTCC, and then had further discussions directly with NC3 and Gateway Technical College (an institution that has developed a successful Center of Excellence with Trane and NC3). Through these conversations, project staff determined it would be beneficial to embed BAS certifications in the existing BAS associate degree program at DTCC (developed in Round 3). In addition to a credit option, they also implemented the program

as non-credit for individuals in the workforce. By implementing BAS Level 1 and 2 certification curricula developed by NC3 and Trane, DTCC was able to establish the new BAS lab as a Center of Excellence.

DTCC received the Level 1 curriculum from NC3 in the summer of 2015, at which time the two instructors participated in the associated training. The credit instructor was a DTCC employee whereas the non-credit instructor was a Seiberlich Trane employee (Seiberlich Trane is the Delaware local affiliate of Trane). The program was first implemented in the Fall 2015 semester. The Level 2 curriculum was received by DTCC in the summer of 2016 and implemented in the Fall 2016 semester. The BAS instructors attended training on the new curriculum that summer and tailored it to fit with the DTCC program.

Project staff and their employer partner, Seiberlich Trane, indicated they were happy with the curriculum and Seiberlich Trane noted the skills taught aligned with the type of worker they would hire. Since Trane and NC3 developed the curriculum, project staff had to make few changes; however, Trane released revisions to the Level 1 curriculum in the Fall 2016 semester, so BAS staff made these changes to their DTCC curriculum as well. The credit BAS instructor remains in contact with NC3 to ensure they are incorporating any further curricular modifications.

PCT
Program staff used a variety of methods to develop the PCT program. First, PCT staff leveraged lessons learned from the development of the Certified Nursing Assistant (CNA) program in Round 2 and used the program structure to create a framework for the PCT curriculum and clinical training. Program staff adapted the framework so that the PCT program included curricula that are aligned with national credentials for CNA, phlebotomy, and PCT. Second, program staff collaborated with a faculty member from DTCC's Medical Assistant (MA) program who had skill sets for both PCT and MA to adapt pieces of the MA curriculum to fit the PCT curriculum. This faculty member also had extensive work experience in the medical field so was able to provide valuable professional input. Lastly, PCT program staff partnered with local healthcare facilities and the Allied Health Department to further refine the curriculum. The local industry partners, program staff, and Allied Health staff participated in an advisory board, which met to discuss program design. Program staff noted that having input from Allied Health helped to incorporate a higher level of professionalism into the courses.

In addition to input and resources from other DTCC medical programs and local industry partners, the PCT Program Coordinator purposefully stayed current on trends in the workforce. The Program Coordinator helped construct the PCT curriculum from textbooks and trends in the current market, while also following state board requirements. Overall, program staff interview participants expressed positive opinions about the PCT curriculum. One interviewee felt strongly that students would be able to "do what is expected of them in both clinics and hospitals" after completing the program. Another commented on the alignment of the curriculum to industry, "I think the curriculum that was built is really where the healthcare field is going, so I'm glad that we are kind of at the beginning of that with the PCT."

Program staff made minor revisions to the curriculum as needed throughout the 4 years. In Year 3, Allied Health made changes to the pathophysiology course in the MA program, so the same changes were applied to the pathophysiology course embedded in the PCT program. One interviewee noted the Anatomy and Physiology course was "a little lengthy; it could be shortened a little bit." Overall, staff were happy with the curriculum and employer partners felt it was aligned with skills they look for in employees.

Evaluation Question 2: Program Management and Implementation
Analysis of data pertaining to program management and implementation revealed findings related to the program administrative structure, program implementation, programmatic improvements made using grant funds, delivery methods, and student support services. Findings for each of these themes are presented in the following sections.

Program Administrative Structure
At the highest level of the program administrative structure was the TAACCCT Round 4 Principal Investigator, who oversaw all project activities related to the BAS and PCT programs at DTCC. Overall, program staff were pleased with the Principal Investigator's management and felt that she was supportive.

Within each program, the administrative structure varied slightly. The BAS certificate program is housed in DTCC's Energy Management Department. The Department Chair, who was also involved in the Round 1 and 3 projects, served in a supervisory role for the BAS program. The Chair reported to the Dean of Instruction who oversaw planning, budgeting, and development of the Trane Center of Excellence, and building partner relationships. The Assistant Dean of Instruction and one BAS instructor were also part of the project. The BAS instructor implemented the curriculum, provided instruction for the BAS credit certification courses, and served on the advisory board with the local employers. He was viewed as a content expert in BAS and provided valuable input for program and curriculum design.

The Workforce Development and Community Education Division at DTCC was responsible for developing and implementing the non-credit portion of the BAS certificate program. Finding a qualified Program Manager and instructors was a challenge for the non-credit program. There was no grant funding dedicated to hiring a non-credit instructor, and project staff noted it was a challenge to find an instructor that had the qualifications to teach BAS Level 1 and 2 Certificate courses. The program did, however, have one instructor, a Seiberlich Trane employee. Due to difficulty finding a Program Manager, the Energy Department Chair took on a dual role in managing the BAS credit and non-credit programs. Project staff indicated that most of the grant budget went to equipment, and there was an unfulfilled need for funding to go toward faculty and support personnel.

For the PCT program, first implemented at the Wilmington campus, the Program Manager was part of the Workforce Development and Community Education Division at DTCC. The Program Manager oversaw the project and conferred with senior partners for approval of activities. Assisting the Program Manager was an Assistant Director and a Program Coordinator who was a Registered Nurse. She led the faculty and administrative staff working on the program. One instructor served in a support role rather than teaching, acting as a point person between

instructors and administrative staff. She also helped students with career support, letters of recommendation, résumés, and course planning. Overall, staff indicated that they felt the administrative structure was effective and that their project staff worked well together as a team.

The PCT program was expanded to the Georgetown campus in January 2017. Project staff reported challenges with finding qualified instructors, and in particular, finding qualified instructors that were available during the day. The instructor position was part-time and on a contract basis, so there was a lack of long-term commitment to the position. There was turnover with CNA instructors, which posed a challenge for implementing this portion of the program. Moreover, project staff noted that communication amongst the team members could have been more consistent and that moving forward, they will meet more regularly.

Program Implementation
Though the Round 4 grant began in October 2014, DTCC did not receive funding approval until May 2015. Despite delays, TAACCCT project staff began preparing and planning for Round 4 project activities in January 2015. Pre-funding project activities included meeting with the Delaware Department of Labor's Career One Stop to discuss proposed Round 4 programs to generate interest from local employers. Project staff also held meetings during this time to discuss program implementation plans. The following sections describe the program implementation process for each program.

BAS
In Year 1 of the grant, BAS program staff focused on renovating the lab space and procuring new equipment to create the Trane Center of Excellence. Project staff and local employers convened a BAS lab kick-off meeting in March 2015 and continued to hold weekly meetings to discuss the lab design and equipment procurement and installation. The Trane Center of Excellence schematics were established and equipment arrived in July 2015, at which time renovations to the new lab began. The Trane Center of Excellence was completed in September 2015.

Also in 2015, BAS instructors received the Level 1 curriculum, attended the associated training, adapted the curriculum to align with their lab (variations were possible due to equipment available in the lab), and began marketing the program. The program was marketed to local businesses, career one-stops, and the community. There was a lot of interest in the program in this first year, mostly by students who were enrolled in the BAS degree program. The for-credit Level 1 certification curriculum was embedded in the degree program but there was a delay in rolling out the non-credit version this first year.

In the summer of 2016, the BAS instructors received the Level 2 curriculum from NC3, attended training, and adapted the curriculum to fit with their lab setting. They also worked with the lab technician to develop a lab manual to assist students with meeting learning objectives for both certifications. The Level 2 curriculum was first implemented in the following semester (Fall 2016) and was also embedded into the BAS degree program courses. In the Spring 2017 semester, the non-credit offerings of Level 1 and 2 certifications were rolled out and credit coursework was formatted to be delivered online through DTCC's Learning Management

System. Also this semester, program staff implemented Level 1 curriculum modifications released by NC3 the previous fall semester.

Due to initial delays in receiving grant funding from USDOL, DTCC had the option for a 6-month extension for program funding; however, due to low enrollment, DTCC did not pursue additional funding for the BAS certification program. Grant funding for the BAS certification program ended as of September 2017. The non-credit BAS instructor left Seiberlich Trane and discontinued teaching at DTCC. Due to low enrollment, a replacement instructor has not been requested. The credit instructor continues to maintain his NC3 certifications and is currently in discussion with NC3 about program revisions.

PCT
At the start of the grant, PCT program staff focused on renovating the lab space, purchasing and installing equipment, and curriculum development. Due to delayed funding, classroom lab renovations were also delayed. Though renovations were in progress in Year 1, they were not completed until April 2016. Once lab renovations were completed, instructors participated in professional development on use of the equipment and the virtual reality system.

Despite delays in classroom renovations, project staff were able to develop, obtain institutional approval for, and implement the PCT curriculum. Project staff held informational sessions for students in Year 1 to market the program and enrolled a full cohort of students who started in the Summer 2015 semester. Since the PCT lab was not yet established, students began with Anatomy and Physiology, a class that does not require a lab component. Once renovations were complete, they proceeded to complete the full program, including participation in clinical experiences for each section (i.e., CNA, phlebotomy, and PCT).

Implementation efforts were first carried out by the Wilmington campus. The PCT program was later expanded to the Georgetown campus in January 2017. When setting up the lab space and implementing the curriculum, the Georgetown campus used guidance from the established program in Wilmington. Their program was available to students in the Spring 2017 semester. While the PCT program typically started with the CNA section, they had to rearrange the design due to difficulty finding and retaining a CNA instructor. Instead, the CNA portion was placed after phlebotomy and PCT. Program staff noted this was not ideal as many of their students were not interested in the CNA portion and dropped the program after completing the other two sections. For future programming, they plan to deliver the CNA portion first.

Program Improvement or Expansion Using Grant Funds
For both the BAS and PCT programs, Round 4 funding allowed DTCC to expand on programs established in previous rounds. The new programs developed under Round 4 offer certification-level credentials and include new lab spaces. Program expansion is discussed in the following sections.

BAS
Round 4 funds used for the BAS program enabled program staff to build on the BAS associate degree program established in Round 3. Using Round 4 funds, project staff expanded the number and type of certifications available and provided a non-credit option for those already in the

workforce. The new BAS program offered students stackable BAS Level 1 and 2 certifications, endorsed by NC3, to further education or employment outcomes. DTCC is the only institution of higher education (IHE) in Delaware that offers an associate degree program in BAS, and now is also the only IHE to offer BAS Level 1 and 2 certifications. Incorporating these certifications within the BAS program was beneficial for students, providing them with additional industry credentials.

Grant funds also enabled BAS program staff to build the Trane Center of Excellence. According to program staff, they utilized an empty lab in the Energy Management Department for the new Trane Center of Excellence. Program staff purchased Trane equipment for the new lab, such as handlers, a chiller, a boiler, and BAS controls that students used to wire and control those systems. Program staff conveyed that the grant allowed for improved equipment available for students, and that they will be able to use this equipment well into the future. Furthermore, funding was used to send BAS instructors to Trane curriculum and equipment training.

PCT
Round 4 funding for the PCT program enabled program staff to expand on the accelerated nursing program established in Round 2. The newly developed PCT program prepared students for nationally-recognized credentials for CNA, phlebotomy, and PCT. DTCC offers the only PCT training program in the state. Students benefit from this opportunity by earning industry credentials while enrolled in the program, thus having the opportunity to be gainfully employed while continuing their education. The curriculum was designed as a pathway to other degrees at the college, particularly the accelerated nursing program. Students who complete the PCT program and choose to continue on to the accelerated nursing program benefit from advanced placement into the program. Program staff explained that they expanded the availability of the PCT program to the public at the end of the grant, as there is high demand for PCTs in the community as well as a wait list for students enrolling in the program.

According to program staff, DTCC nursing labs were outdated. Grant funds enabled them to purchase new equipment and make updates to the classroom and labs, including CNA equipment and hospital beds. The new classroom lab space replicates the environment one would encounter in a hospital, physician's office, or lab facility, and includes items such as hospital furniture and phlebotomy chairs. In addition, DTCC program staff obtained a virtual reality training program for students to practice their skills, in conjunction with the hands-on learning in the lab. One staff member commented, "…it's just very exciting to be able to practice hands-on with virtual reality so you are not hurting anyone, but you are learning as you go." The lab space and virtual reality program constitute infrastructure that will remain available to the healthcare programs for future programming.

Delivery Methods
The BAS program was offered as a credit and non-credit program. There were no previous course requirements, so students could take developmental courses while they were enrolled in the program. The program included hands-on learning in the lab, which gave students experience working with equipment used in the industry. Further, the program was competency based, where students must demonstrate mastery of skills in the lab in order to earn credentials. In Year 2, the BAS instructors adapted the curriculum to be more self-study focused by incorporating

curriculum on their Learning Management System (Blackboard). Lastly, the non-credit program was offered as a week-long training, providing program completers with certification upon completion.

In order to enroll in the PCT program, students must first complete the requisite developmental courses, if needed. Once matriculated, students began with curriculum in CNA training, which prepared them for CNA certification testing. They then moved on to the phlebotomy curriculum, which prepared them for phlebotomy certification testing. Lastly, students completed the PCT curriculum, earning the National Health Career Association's Certification of Certified Patient Care Technicians. Aligned with each portion of the program was a clinical, where students spent time performing skills learned (after completing coursework and labs) at employer sites. The benefit to the sequential design was that students earned a credential up front that allowed them to obtain gainful employment while they worked toward completing the program. The program was non-credit; however, the Wilmington campus retroactively awarded credits to program completers, which can be applied to the nursing degree program. The PCT program was a 1-year program that included a combination of didactic and experiential learning. The classroom lab space contains state of the art equipment that mirrors a hospital setting, providing students with a learning environment similar to where they will be working. Like the BAS program, the PCT program was also competency based, where students must demonstrate mastery of skills in the lab as well as in the clinical setting.

Support Services
All DTCC students, including non-credit students, have access to a variety of services, including clubs, student organizations, tutoring, writing services, and a computer lab. Overall, there was no evidence of support services specific to the BAS certification program; however, students in the program did have access to a lab technician who was available for technical support.

In addition to career preparation services, such as résumé writing and mock interviews, the PCT program offered support for students' personal needs. Project staff connected students to counseling to address a wide range of needs, including homelessness and other personal issues that may affect their academic or career success. The PCT faculty were also trained to identify social and emotional problems. One student commented that the PCT staff were very accommodating of her personal learning needs.

PCT program staff indicated they are highly dedicated to the success of their students as evident by helping students overcome personal barriers that may prevent them from completing the program or gaining employment. One major hindrance cited by program staff was finances. Though the grant enabled students to enroll in the program tuition-free, students in the PCT program had many other program-related expenses, including books, certification exam fees, and materials/requirements for clinicals (e.g., drug screening, immunizations, uniforms). DTCC covered these expenses for the students in the program, and when possible, assisted with other personal needs such as transportation. Students felt as though program staff were supportive in helping them find the resources they needed to stay enrolled and complete the program.

Student support was seen as a critical area for sustaining the program, but also for reaching their main goal—student employment. Program staff indicated their student population tends to be "at

risk" and in need of personal and career support to be successful in earning a credential and finding employment. Program staff were diligent in findings ways to support student expenses through other college resources, as much of these costs could not be supported by grant funding. They recognize sustaining these resources will be a challenge for future cohorts.

Evaluation Question 3: Student Enrollment and Support Processes
DTCC offers the Accuplacer exam, which students take prior to enrollment. The Accuplacer assesses college readiness in the areas of math and English. PCT applicants who do not pass are expected to complete the developmental math or English courses before starting the PCT program (which is standard for Allied Health programs), whereas students applying to the BAS program are able to take these courses while enrolled in the program.

Other than the Accuplacer exam, which is in place for all DTCC students, there was no evidence provided of in-depth assessments conducted for BAS applicants. However, the PCT program implemented a rigorous application process. PCT program staff held monthly information sessions where they explained the program and expectations of students. Students were required to attend a session prior to applying for the program. They then completed an application and took the Accuplacer exam to make sure they were at a 10th grade level for math and English. From there, if they completed the information session and placement exam, they were invited for an interview. Interviews are intended to find individuals who are committed to the program and interested in gaining employment in the nursing industry. Program staff indicated they interview about 25 individuals and select 10 per cohort.

Using placement exams and an in-depth interview process helped to ensure candidates were sufficiently prepared and set up for success in their program. In addition, once PCT students were enrolled in the program, they worked with a student enrichment coordinator who helped them with registration, workforce readiness (e.g., résumés, interviewing), and finding employment. The student enrichment coordinator worked with each student to help them successfully navigate the program and overcome barriers they may have faced along the way.

BAS program staff did not identify any program specific career guidance for their students. Rather, staff noted that students are able to use school-wide resources offered by DTCC, such as the Career Center, where students can access support in résumé writing, interviewing, and internships. The PCT program included presentations on résumé writing, interview skills, and professionalism in the workplace. Program staff relayed job opportunities to students and helped them with the application and interview process. Some program staff reported they are available to assist students even after completion of the program to ensure they find employment. Moreover, guest speakers from nursing, medical assistant, and occupational therapy programs at DTCC, as well as external industry partners, delivered presentations to students.

Students indicated the résumé writing assistance was especially helpful as some students were entering the industry after having worked in a non-healthcare related industry previously. The résumé assistance helped them draw connections between their previous employment and the healthcare industry. Furthermore, students who were new to the workforce found it helpful as they had little to no experience with résumé writing. Students liked that program staff who know the healthcare industry well were able to give them industry-specific advice.

Evaluation Question 4: Industry Partner Contributions
TAACCCT project staff built relationships with the TAA Coordinator and Career One Stop center coordinators from the Delaware Department of Labor, which was beneficial for student recruitment and local employer involvement in project activities. Project staff also utilized existing industry partnerships and developed new partnerships. Local industry partners contributed to program and curriculum development, clinical experiences, employment, faculty training, and ensuring the programs meet the needs of the labor market.

BAS
DTCC partnered with Seiberlich Trane for development of the Trane Center of Excellence and implementation of the BAS certification program. Seiberlich Trane employees participated in the BAS advisory board and provided input on program design, curriculum, lab schematics, and technical support for the lab. There were also other industry partners on the BAS advisory board who provided input on degree program design and curriculum; however, program staff indicated other partners were less involved in the design and development of the certification program because it was highly aligned with Trane.

A Seiberlich Trane employee served as the instructor for the non-credit certificate program. Moreover, Seiberlich Trane offered support in the job placement of graduates and identification of internships for credit students. Seiberlich Trane has hired DTCC graduates from other DTCC programs, so program staff were hopeful that BAS graduates would find employment there as well. In terms of employment, Seiberlich Trane indicated they are willing to hire program graduates as positions become available; however, they do not have much turnover, so there are few job openings. They noted that when they do hire, it is often difficult to find skilled technicians. However, they felt DTCC has done a good job of preparing students for the industry. The program is particularly beneficial for Seiberlich Trane as students in the certificate program are trained on Trane equipment.

PCT
DTCC has a network of local healthcare providers that they engage with regularly for other healthcare programs on campus. Program staff leveraged some of these existing relationships for the PCT program, particularly for curriculum and program design feedback, clinical placements for students, and student employment. Program staff also reached out to new healthcare partners to best suit the needs of their students. Their network of providers included a variety of facilities, including hospitals, medical centers, Veterans Affairs hospitals, laboratories, home health care, and long-term care. Program staff reported they find it important to have a variety of partners, particularly for clinical settings, so that students are exposed to different healthcare environments during their training. Industry partners, especially those that offer clinicals to students, indicated they are interested in hiring program completers and that there continues to be a need for CNAs and PCTs in the local area.

Being that DTCC is the only community college in Delaware, PCT program staff reported they are very engaged with local employers. They regularly participated in advisory board meetings with local healthcare providers. Staff also attended other events, such as Delaware Pathways, which is a convening of community stakeholders to discuss local workforce development. However, the advisory boards are not program specific (i.e., there is no advisory board solely for

the PCT program), so some staff indicated it can be difficult to have specific communication regarding details of the PCT program. Program staff feel it will be important to keep communication open with employers to gain feedback on how students are doing while employed, or receive guidance on updates that may be needed for the curriculum to keep current with the latest trends in CNA, phlebotomy, and PCT training.

Program staff pointed out that some industry partnerships are stronger than others. One relationship did not work out well, which program staff attributed to differences in levels of buy-in between higher administrative staff—who were excited about the partnership—and the lab technicians, who were less engaged. The industry partner also had high staff turnover, which made it difficult to schedule students for clinical.

According to staff, the grant work strengthened their relationships with employers and they anticipate these relationships will continue. Since some relationships did not serve their program as well as planned, they also feel they should continue to bring in new partners.

Evaluation Questions 5–7: Student Outcomes
Evaluation Questions 5–7 address *increases* in student outcomes; particularly, program completion, retention, and employment outcomes. The evaluator was unable to identify a comparison group or comparable historical data for the BAS certification and PCT programs. Thus, *increases* could not be assessed because it was not possible to compare outcomes to a baseline measure. The following sections discuss the program completion, retention, and employment data for the BAS and PCT programs without addressing whether there has been an increase in these outcomes. In addition to discussing outcomes, the evaluator presents basic demographic information about each student population to provide context on the sample under study.

BAS
Thirteen students enrolled in the BAS certification program during the grant period; 11 enrolled in the credit program and 2 enrolled in the non-credit program. Table 1 displays the demographic information and other characteristics of these students. Most BAS students identify as male, Caucasian/White, and are not Pell-eligible or veterans. The average age at time of enrollment was 30 years of age; however, there was a wide range, with the youngest being 18 and oldest 60. Of the eight credit students who are still enrolled or completed the program, half were enrolled part-time and half full-time. The three credit students that withdrew from the program were enrolled part-time. Part-time/full-time enrollment status does not apply to non-credit students.

Table 1.   BAS Student Characteristics

Characteristic	Frequency
Gender	
Male	12
Female	1
Ethnicity	
American Indian or Alaskan Native	1
Asian	2
Black or African American	1
Caucasian/White	7
Chose not to indicate	2
Pell-eligible	
Yes	4
No	9
Veteran	
Yes	1
No	10
Missing data	2
Age at first enrollment	
Mean (Standard Deviation)	30 (13.04)

Program Outcomes

Of the 11 credit BAS students, 5 completed the program, 3 are still enrolled, and 3 withdrew from the program. Three of the program completers attained both Level 1 and 2 certifications; whereas the other two program completers attained the Level 1 certification only. Two of the students who are still enrolled have completed the Level 1 certification and are working toward the Level 2. Lastly, of the three students that withdrew from the program, two attained the Level 1 certification, but did not remain enrolled to complete the second certification. In terms of employment outcomes, four of the program completers attained employment; there was no evidence of employment for the other credit BAS participants.

The two non-credit BAS program students completed the program, but it is not clear from the data whether they completed only the Level 1 certification, or both Level 1 and 2. There was no evidence of employment attained.

PCT

There were 55 PCT students enrolled during the grant period. Of the 55 students, 41 enrolled at the Wilmington campus and 14 at Georgetown. Table 2 displays the demographic information and other characteristics of the PCT students. No data were provided regarding veteran status, and there were no Pell-eligible students. The average age at time of enrollment was 33; however, similar to the BAS student population, there was a wide age range, with the youngest being 19 and oldest 65.

Table 2. PCT Student Characteristics

Characteristics	Frequency
Gender	
Male	11
Female	44
Ethnicity	
Asian	2
Black or African American	6
Caucasian/White	21
Hispanic/Latino	4
Chose not to indicate	22
Age at first enrollment	
Mean (Standard Deviation)	33 (10.65)

Program Outcomes

Table 3 displays PCT program outcomes in terms of the frequency of students who completed the program, earned a credential, and gained employment. The data are disaggregated by campus and the term in which students started the program (indicating different cohorts).

Table 3. PCT Program Outcomes

Campus		Start Term		Program Status		Credential	Employed
Wilmington	41	Summer 2015	10	Completed (Fall 2015)	8	8	7
				Withdrew	2	-	2
		Fall 2015	14	Completed (Fall 2016)	13	13	12
				Withdrew	1	-	1
		Fall 2016	9	Completed (Fall 2017)	9	9	8
				Withdrew	0	-	-
		Fall 2017	8	Completed (Spring 2018)	5	5	unk
				Withdrew	3	-	unk
Georgetown	14	Spring 2017	8	Completed (Fall 2017)	5	2	5
				Withdrew	3	-	unk
		Fall 2017	6	Still enrolled	2	-	unk
				Withdrew	4	-	unk

Note. "unk" is indicated where employment data are missing. Dashes are included where data are not applicable.

All Wilmington students who completed the program earned credentials (CNA, phlebotomy, and PCT certifications). However, only two of the five students at Georgetown who completed the program earned credentials, suggesting that the other three program completers have not taken the certification tests. Moreover, data demonstrate that across both campuses, most students who completed the program are employed. In addition, data show that some students who withdrew are also employed. This may be due to students gaining employment as CNAs or phlebotomists part-way through the program and discontinuing after starting their job, which was mentioned in the program staff interviews.

Age was examined as a predictive factor for program withdrawal. The average age of students who withdrew was 26, while the average age of those who did not withdraw (completed or still enrolled) was 35. Inferential statistics showed that age was a significant predictor of whether or

not students withdrew, showing that older students are more likely to remain enrolled and complete the program, and younger students are more likely to withdraw.

Evaluation Question 8: Student Perceptions
Only one BAS student participated in the interview process throughout the grant period, and this student eventually withdrew from the program; thus, most findings presented in this section pertain to PCT student perceptions. The BAS student who participated was in their first semester of the program when interviewed and reported that it had met their expectations at the time. In particular, they were happy with the amount of hands-on experience involved in the program.

PCT
Overall, students shared positive feedback regarding their experience in the PCT program. Several students indicated they would (or already have) recommend the program to others. The following sections present findings from the student interviews and focus groups pertaining to their perceptions of the PCT program.

Motivation for Pursuing PCT
Most PCT students who participated in the evaluation reported they had previous experience in healthcare, such as having a health-related degree or work experience, or taking care of a friend or family member. Students who had previous degrees or work experience in non-related fields enrolled in the program because they were looking for a different career path. Most students stated their motivation for pursuing this program was to obtain a career in the nursing industry. Students were particularly drawn to the design of the program (e.g., having three stackable credentials), and felt the program is a good starting point for entering the nursing field.

Program Structure
The PCT program was designed to build on curriculum as one progresses through (i.e., CNA gives you the basics, phlebotomy is a more specialized skill, and PCT expands on these). Students found the curriculum challenging, but felt there was ample opportunity to succeed. Overall, students believed they were prepared for the tests, especially with a monthly outline of what to expect during the course.

The program provides students the opportunity to engage in applied learning in the onsite DTCC labs as well as at clinical sites, and students appreciated the hands-on aspects of the training most. Students valued the opportunity to practice in the lab before clinical. For example, students were able to perform blood draws on each other, to which one student commented, "…we got different perspectives on different people that we're going to deal with." The student further explained that some students were nervous while others were calm during the blood draw, so it taught them how to handle different patient reactions. Students felt this practice made them more confident in their ability to do the work in a clinical setting. In addition, students reported that the equipment was of high quality and that they enjoyed their time in labs.

Students liked having the opportunity to participate in clinical experiences at local healthcare sites. Some students reported that their CNA clinical, however, felt too long and was a more relaxed environment than they anticipated. They explained that in the program, they learn the best standard practices in healthcare, but they did not see the CNAs at the clinical site carrying

out the same standard of practice. Though surprised, they felt it was a good learning experience for what "real world" industry is like.

PCT students go through the program as a cohort, typically of about 10 students. They conveyed satisfaction with the size of their classes, elaborating that the smaller class size provided the opportunity for them to work closely with instructors. In particular, they felt supported by program staff, which motivated them to complete the program. In addition, they formed a bond with others in their cohort, and appreciated that everyone was of different backgrounds with varying ages and life experiences.

Program Administration
Students indicated the program could have been more organized, particularly in terms of the schedule and expectations for students. The structure of the phlebotomy portion of the program was appreciated, and there was clear communication and expectations about what they needed to study for tests. However, they reported the PCT portion of the program was not as clear. There was an abundance of information to know and some students felt unsure of how to prepare for exams, noting "this is a lot of information, what is the most important of it?" In addition, there were multiple instructors involved in the PCT program and students would have liked the instructors to be more synchronized and organized, in terms of the schedule and conveying expectations to students. Students expressed these opinions to the evaluator and explained that they have also shared their feedback with staff while in the program. Program staff were open and receptive to feedback and students felt comfortable sharing their concerns or asking for help. Students believed that one can succeed in the program as long as they are comfortable talking to the instructors. One student reported, "As long as you are comfortable expressing, hey I'm not really following this, then you know you will be taken care of."

Career Preparation
Students found the résumé writing assistance and other professional skills development (e.g., interview techniques, completing applications) helpful. In particular, they were happy to receive assistance from instructors that know the healthcare industry, as opposed to a general advisor. Further, students had the opportunity to go to job fairs. They liked that they were given a list of employers who would be there, which helped them determine if going was worth their time.

Students had varied career goals, but all relating to the healthcare field. Most students plan to work as a phlebotomist or PCT, or a combination of both after completing the program. Some want to continue their education to eventually pursue a nursing degree. Students commented that DTCC has a good reputation and think that they have been set up for successful employment. The clinical facilities students attended are well regarded, which also helps with employment. Students noted that colleagues who went through CNA were able to find jobs quickly and in general, program completers were able to attain what they were looking for (i.e., employment or additional education).

Impact
The program had an impact on students in several ways. One student noted the positive influence it has had on their personal health as a result of learning about the body and how it works. In addition, another student commented that it enhanced knowledge of how to take care of their

family's health needs. It also impacted their academic and career path—the program at DTCC was recounted as a good first step and confidence booster. One student noted that it helped build confidence as they previously had difficulty getting into college, which was discouraging. Another student claimed that the program helped them figure out what path they wanted to take in the healthcare industry. Lastly, the TAACCCT grant enabled students to earn credentials tuition free and gain employment quickly to pay off debt from previous academic degrees.

CONCLUSIONS AND RECOMMENDATIONS

Overall, DTCC's Round 4 grant team was successful in implementing the activities as intended, creating two programs targeted specifically for high demand industries. While the BAS Level 1 and 2 Certifications did not realize enrollment as expected, the PCT program has been strong in that regard. Specific conclusions and recommendations for improvement and sustainability beyond the grant are as follows:

- The Trane Center of Excellence for the BAS Level 1 and 2 Certifications was established as planned, using vetted curriculum that Trane and project staff believe is aligned to employer and student needs. However, few students have enrolled and completed the certifications over the course of the grant. It would be beneficial for faculty and staff to gather opinions on the value of the certifications from students enrolled in the BAS degree program to determine what changes may make it more appealing. Further, it is recommended that the usefulness of the certifications be revisited with all BAS industry partners, to garner their opinions on how these credentials fit into their business, as well as the region as a whole. Once determined, value of obtaining these certifications should be communicated to students enrolled or interested in the BAS program during the application/advisement process or through instructor interactions.

- PCT program development and implementation was successful and enrollment has been strong. Leveraging TAACCCT Round 2 lessons learned, national credentials, DTCC's MA program, local healthcare organizations' feedback, and the Allied Health Department, the grant team developed the only formal PCT program in the state of Delaware. The integration of classrooms that simulate real workspace and virtual reality training affords students the opportunity to complete hands-on coursework while being exposed to environments much like the workplace. Students appreciated these experiences, and also highly valued the on-site clinical.

  In general, students expressed positive opinions about the PCT program, particularly the career preparation aspects (e.g., résumé assistance, mock interviewing) and other supports, such as referral to counseling, financial assistance, and help with personal barriers (e.g., homelessness). As staff noted, many PCT students need additional support, and benefit greatly from assistance that helps to remove barriers to program completion and employment. Further, students who have withdrawn from the PCT program tend to be younger than those who completed, indicating that younger PCT students may need more attention in terms of personal barriers. Staff should continue to prioritize the supports in place and work with students individually to find tailored solutions that address their issues.

Finally, PCT students conveyed a desire to see the program be more organized, in terms of scheduling and expectations. Program instructors should work to ensure more consistency in program delivery and communication with students regarding content knowledge expectations.

- The PCT program has established a strong network of employer partners, which is key to student success, as it ensures the curriculum is aligned to industry needs and there are ample opportunities for clinical placements. It is recommended that these partnerships are well-maintained and continue to be assessed. To be effective, partnerships between colleges and companies must have frequent and regular communication, with employers providing repeated guidance on industry changes. Therefore, it is important to keep up the momentum generated in the last 4 years and keep in regular contact with all partners. Further, it would be useful to solicit feedback from partners to determine if there are any challenges to collaboration that need to be addressed. This would include ensuring there is buy-in at all levels of an organization, to avoid a situation like the example mentioned in the Findings section, where upper management was on board, but those working directly with students were not. Feedback could be gathered informally, but systematically, by engaging in targeted discussions with each partner each year.

APPENDIX A: DETAILED METHODOLOGY

For the evaluation of the 4-year grant, Hezel Associates utilized qualitative methods to answer questions regarding implementation and quantitative methods to answer questions regarding outcomes. The following sections outline the data collection and analysis methods implemented.

Data Collection

The data collection methods employed for the evaluation included document review and interviews (focus groups in Year 4) with various stakeholders. The instrumentation and data collection processes for each of these methods are described in the sections below.

Document Review

Hezel Associates developed the Document Review Framework to assess implementation fidelity. The framework is a matrix that outlines project activities, milestones, and deliverables stipulated in DTCC's project work plan. The framework also included space for Hezel Associates to record the date each milestone was accomplished, the status of meeting the milestones, and the evidence provided to demonstrate meeting the milestones.

DTCC shared program related documents (e.g., quarterly reports, meeting minutes, invoices) with Hezel Associates over the 4-year period to demonstrate progress toward the two overarching project activities: (a) establish Trane Center of Excellence for BAS Level 1 and Level 2 certifications and (b) complete curriculum development by building upon established allied heath curriculum and implement the PCT program. As documents were received, Hezel Associates logged document title, date, and a brief description, and recorded notes describing how the documentation supports completion of or progress toward project activities. The completed Document Review Framework is included as Appendix B.

Staff Interviews

Hezel Associates developed a semi-structured Staff Interview Protocol (see Appendix C) to guide conversations with project staff. The protocol contains 10 items that were applicable to project staff from both the BAS and PCT programs. Interviews were conducted in Years 2, 3, and 4. Some protocol items were added or changed in Years 3 and 4 (e.g., program sustainability, curriculum changes). Questions addressed organizational structure and governance, curriculum development, program design, partner support, suggestions to strengthen the project, program sustainability, and overall impressions of the project.

Each year, the Principal Investigator provided Hezel Associates with a contact list of individuals involved in the PCT and BAS programs. Evaluators contacted individuals via email, describing the evaluation and purpose of the interview, and asking for their availability to participate in an interview. A reminder email was sent to those who had not yet responded. Once staff responded with dates and times they were available for an interview, a confirmation email with a consent document attached was sent. Interviews were recorded with participant permission and later transcribed for analysis. Table A1 displays the number of individuals recruited from each program and round of interviews, as well as the number of individuals who participated.

Table A1. Staff Interview Participation Rate

Year	BAS		PCT	
	Recruited	Participated	Recruited	Participated
Fall 2015	4	4	5	3
Fall 2016	3	2	5	3
Spring 2018	-a	-a	13	7

a BAS staff were not interviewed in Spring 2018 due to the program being discontinued.

Employer Interviews

Hezel Associates developed a semi-structured Employer Interview Protocol (see Appendix D) to guide conversations with employer partners. Items were developed to gather feedback from local employer partners who participated in program development or who interacted with students from the program. The protocol consists of 10 open-ended items covering topics such as the background of the company, their involvement with DTCC, and alignment of the programs to industry needs.

There were two rounds of employer interviews, starting in the Spring 2017 semester. For each round, the Principal Investigator provided Hezel Associates with a contact list of local industry partners involved in the PCT and BAS programs. Evaluators contacted each individual via email, describing the background of the evaluation and purpose of the interview, and asking for their availability to participate in an interview. A reminder email was sent to those who had not yet responded. Once the employers responded with dates and times they were available for an interview, a confirmation email with a consent document attached was sent. Interviews were recorded with participant permission and later transcribed for analysis. Table A2 displays the number of individuals recruited for each program and round of interviews, as well as the number of individuals who participated.

Table A2. Employer Partner Interview Participation Rates

Year	BAS		PCT	
	Recruited	Participated	Recruited	Participated
Spring 2017	2	1	8	1
Spring 2018	-a	-a	11	0

a BAS employer partners were not interviewed in Spring 2018 due to the program being discontinued.

Student Interviews

Hezel Associates developed the Student Interview Protocol (see Appendix E) to gather feedback from program participants. The Student Interview Protocol is semi-structured and was used to guide conversations with current and former students in the BAS and PCT programs. The protocol consists of 13 items covering topics such as students' motivation for enrolling in the program, prior school and work experiences, earning credit for prior experiences, career guidance and preparation, employment opportunities, and their opinion of the program and its impact.

For each round of interviews, the Principal Investigator provided Hezel Associates a contact list of students participating in the PCT and BAS programs. Hezel Associates sent an initial recruitment email to students on the contact list, asking them to participate in a 20- to 30-minute phone interview. Hezel Associates and the Principal Investigator sent reminder emails a week

later. Once the interview time was scheduled, interviewees received an informed consent document via email to review before the interview was conducted. Telephone interview participants were asked for verbal consent to participate in the interview and for the interview to be recorded for note-taking purposes.

There were several rounds of student interviews with little participation each time. The first round was conducted in the Fall 2015 semester. Five BAS and nine PCT students were recruited for interviews; three PCT students participated. A second round of interviews was conducted in the Fall 2016 semester, recruiting PCT students only; two students (out of 24 recruited) participated.

The Principal Investigator and evaluator decided to conduct BAS student interviews in Spring 2017 near the end of their program. In April 2017, evaluators recruited BAS students for phone interviews and again recruited students from the PCT program given the low response rate from the previous round of interviews. Six BAS and thirty-four PCT students (Cohorts 1, 2, and 3) were contacted by email to participate in a phone interview. One BAS and three PCT students responded to the email and scheduled a phone interview. All four students did not respond when contacted for the interview and did not respond to attempts to reschedule. To gather student responses to interview questions, the questions were emailed to the program leads who then emailed them to the PCT and BAS students asking for response by email. There were no responses provided.

Student Focus Groups
Due to low student participation in interviews, focus groups were added to the evaluation. Evaluators adapted the Student Interview Protocol to create the Student Focus Group Protocol (Appendix F), with similar questions but geared toward group discussion. PCT focus groups were conducted only, as the BAS program was discontinued, in February 2018. The PCT Program Managers invited current and former PCT students to participate.

One current student was interviewed individually as they were the only one present for that scheduled focus group. The second group consisted of three current students and an instructor. In addition, one former student participated in an individual interview. Students also had the opportunity to participate in a phone interview at a later time; however, there were no participants. All interview and focus group records were transcribed for analysis.

Data Analysis
Hezel Associates analyzed data from each data collection method separately, then summarized, compared, and synthesized findings to answer the evaluation questions. The analysis methods used for the evaluation are described in the following sections.

Document Review
Hezel Associates researchers collected and sorted program documentation received from the Principal Investigator, compiling a list of documents received, along with a brief description of the contents of each document. Once documents were collected and sorted, each document was compared against the Document Review Framework. Evaluators included a description of what project staff have done to justify fulfilling milestones under *Evidence*. The dates project staff

fulfilled each milestone, based on document dates, were listed under *Date*. Hezel Associates researchers marked the status for meeting the listed milestones as (a) *met with documentary evidence*, (b) *met through self-reporting*, (c) *not met*, or (d) *in progress*. In addition, for milestones that were met, evaluators noted fidelity to the work plan timeline.

Interviews/Focus Groups
Since the interview and focus group protocols (i.e., staff/faculty, student, and employer) were established prior to the beginning of data collection, evaluators used a *preordinate scheme* to guide the analysis. Interview and focus group recordings were transcribed for analysis. From the loosely written transcriptions developed, evaluators applied an open coding approach. Using this method allowed evaluators to organize the lengthy content into bits of data, which were then aligned to the conceptual framework established by the evaluation questions of interest. Each excerpted bit was tested against not only the construct of interest, but also against the accumulating narrative content associated with it, applying a constant comparative method to isolate each construct and clarify how it was labeled or coded. This approach manages and systematizes the process of turning bits of information into descriptions, raising descriptions to low-level inferences, and developing recommendations based on higher-level interpretations.

Extant Student Data
Hezel Associates received institutional data from DTCC for students in the BAS and PCT programs. Hezel Associates reviewed DTCC's existing programs for potential comparison group data; however, it was determined that there were no programs for which comparison group data would be appropriate for assessing program impact (e.g., program content or credentials were different). Further, while DTCC was able to provide most of the data requested, they were unable to obtain much of the employment and wage data from the Delaware Department of Labor, despite considerable effort. Data that were provided to Hezel Associates were mostly analyzed with descriptive statistics. Logistic regression was used to examine age as a predictor of retention and program completion for PCT data.

APPENDIX B: DOCUMENT REVIEW FRAMEWORK

Activity 1: Establish Trane Center of Excellence for Building Automation Systems (BAS) Level 1 and Level 2 Certifications					
Year	Milestones	Deliverables	Date	Status	Evidence
1 4/1/15 to 9/30/15	a. Renovate lab space	1. Lab outfitted for Trane BAS Level 1 and Level 2 Certification training. 2. Schematics and equipment lists for the Trane Center of Excellence training lab. 3. Faculty trained to use and maintain equipment. 4. Faculty ready to begin implementation of certification programs. 5. Syllabi, curriculum, and institutional approval for Trane BAS certification training	8/2015	Met	Between 6-8/2015, there is evidence of schematics established by Trane, weekly meetings with DTCC and Trane to discuss progress of lab renovations. Lab was ready for the first cohort.
	b. Purchase and install Trane equipment		8/2015	Met	Evidence provided showed purchase of equipment. DTCC and Trane had weekly meetings to discuss progress of lab, delivery of equipment, installation of equipment. Lab completed in 9/2015.
	c. Send 2 program faculty members to Trane Conference for training on BAS Level 1 & 2 curricula		7/2015 (Level 1), 6/2016 (Level II)	Met	2 individuals attended BAS Level I training in 7/2015 and earned their certificate. Level II curriculum was not completed until 2016, so the same individuals completed that training in 6/2016 once it was available.
	d. Initiate faculty professional development on Trane equipment		7/2015 (Level 1), 6/2016 (Level II)	Met	Same as Trane certificate training.
	e. Obtain Trane BAS level 1 and 2 curricula		7/2015 (Level I), 6/2016 (Level II)	Met	Curricula are through NC3. Level I received in 7/2015. Level II was delayed. It was available to DTCC 6/2016. Level I curriculum embedded in course (NRG 140). Level II was more complex, unable to embed in course. Developed a new course (NRG 215) that consists of both levels (implemented in Spring 2017 semester).

Activity 1: Establish Trane Center of Excellence for Building Automation Systems (BAS) Level 1 and Level 2 Certifications					
Year	Milestones	Deliverables	Date	Status	Evidence
2 10/1/15 to 9/30/16	f. Conduct faculty training on curriculum		7/2015 (Level I), 6/2016 (Level II)	Met	2 individuals received Level I and Level II training certificates
	g. Enhance recruitment and outreach through marketing strategies		2015	Met	Evidence of 1-page ad about the BAS certificate program. PI also presented on the program to the DDOL Career One Stop to help generate interest in the program.
	a. Recruitment and outreach	1. Syllabi and curriculum 2. Student outcomes and comparison data		Unk	As of 1/2016, program received attention in the college and community, better than expected enrollment in credit BAS program. As of 11/2016, non-credit continued to reach out to local businesses and community leaders. Classes "promoted through various venues."
	b. Conduct an in-depth assessment to select participants into the program			Unk	*Not clear from evidence*
	c. Enroll 2 students		2016	Partially met (5 enrolled for credit BAS)	2015 2nd Qtr. Report (not yet Year 2): hoping to start delivery in August or September. 8/26/15 email (not yet Year 2): "We are still having some challenges with implementing the BAS Level 1 certificate. It is currently embedded in a course for the credit side, but start-up for the non-credit may not happen until January." 2015 3rd Qtr Report: Only credit BAS 1 curriculum up and running—5 students. All 5 passed and received BAS 1 certificate.
	d. Graduate 2 students		2016	Partially met, at least 2	As of 2/2016 the 5 students enrolled in Level I passed the test and earned the certificate. 4 of them

Activity 1: Establish Trane Center of Excellence for Building Automation Systems (BAS) Level 1 and Level 2 Certifications					
Year	Milestones	Deliverables	Date	Status	Evidence
				passed level 1 certification	were retained for the Level II certification.
	e. Track student success, retention, and graduation		2016	Met	Appear to be, report numbers in the progress reports.
	f. Review/revise curriculum		2016	Met	11/2016 Instructor revised lab manuals and lesson plans to align with training received on Level II curriculum. As of 1/2017, instructor and lab tech worked on implementing changes in new curriculum in Level I training. As of 5/2017, they completed formatting the Level I and II certification training for delivery through college's LMS (Blackboard) and adaptation to the Trane Lab. Received Level 1 curriculum modification as of 2/2017, both instructors completed the new certification test. The curriculum was updated in 4/2017.
3 10/1/16 to 9/30/17	a. Enroll 4 students	1. Syllabi and curriculum 2. Student outcomes and comparison data 3. Employment tracking data	2017	Not met, but total enroll-ment is on track	Appears they enrolled 2 this year.
	b. Graduate 3 students		2017	Not met, but total level 1 certifi-cation on track	As of 8/2017, 2 additional students received the Level I certification (7 total at this point). Three students have completed the Level 2 training.
	c. Track student success, retention, and graduation		2017	Met	Appears to be, report numbers in the progress reports. As of 5/2017, had 2 additional enrollments and 4

Activity 1: Establish Trane Center of Excellence for Building Automation Systems (BAS) Level 1 and Level 2 Certifications					
Year	Milestones	Deliverables	Date	Status	Evidence
					students retained (after Level I certification). As of 10/2017, a total of 7 students completed the training, 3 completed both levels.
4 10/1/17 To 9/30/18	a. Follow up only	1. Student outcomes and comparison data 2. Employment tracking data	NA	N/A—BAS program ended early	DTCC wrapped up programmatic funding as of 9/2017.

Activity 2: Complete curriculum development by building upon established allied health curriculum and implement the Patient Care Technician Program					
Year	Milestones	Deliverables	Date	Status	Evidence
1 4/1/15 to 9/30/15	a. Renovate existing classroom space	1. Lab outfitted with Patient Care Technician training 2. Schematics and equipment lists for Patient Care Technician lab 3. Faculty trained to use and maintain equipment 4. Faculty ready to begin implementation of program 5. Syllabi, curriculum, and clinical internship agreements 6. Institutional approval for Patient Care Technician Program	4/2016	Met	7/14/15 Email from PI: "For now, the main thrust is to get the renovations done and equipment in place for the start of classes in late August." 2015 2nd Qtr. Report: renovations are in preliminary stages; bids are being solicited. Renovations will hold up the start date of the programs until completed. 8/26/15 email: "Renovations on the lab for skill part (for PCT) has not even started." "Neither of the labs are complete…we have not even begun on the PCT yet. It is hoped to be up and running by January 2016." 2015 3rd Qtr Report: Lab renovation delayed due to funding. Expected to be complete by 2/2016. Lab renovations complete as of 4/2016.
	b. Purchase and install equipment		4/2016	Met	7/14/15 Email from Martha: "For now, the main thrust is to get the renovations done and equipment in place for the start of classes in late August." 2015 3rd Qtr Report: expected 2/2016. Lab renovations complete as of 4/2016
	c. Ensure faculty readiness for use of equipment		NA	Met	Instructors have appropriate skills.
	d. Complete curriculum development by building upon established allied health curriculum		2015, ongoing	Met through self-report, within timeline	2015 2nd Qtr. Report: curriculum and syllabus are being finalized. 2015 3rd Qtr. Report: Lab Corp and Christiana agreed to be clinical sites.

Activity 2: Complete curriculum development by building upon established allied health curriculum and implement the Patient Care Technician Program					
Year	Milestones	Deliverables	Date	Status	Evidence
					E.g., meeting agendas and attendance for PCT program curriculum development. As of 8/2016, curricula have been completed for the PCT program. 5/2017: also established VA Hospital in Elsmere for phlebotomy clinical, and Mary Campbell Center where students can complete CNA or PCT experience.
	e. Obtain institutional approval		Unk	Met	No evidence, but lab and program are in place, implying institutional approval.
	f. Conduct program faculty training		2016, ongoing	Met	7/2016 faculty training in progress. As of 11/2016, "training is ongoing" As of 2/2017, faculty trained and working with students. 8/2017 faculty trained in virtual reality training as a tool to enhance student learning in the classroom.
	g. Conduct an in-depth assessment to select participants into the program (not in work plan, not part of grant award)		NA	NA	NA
	h. Enroll up to 10 students		8/2015	Met through self report. within timeline	2015 2nd Qtr. Report: first course will begin mid-July. Report also said they hope to offer by August or September. Enrollment delays are due to renovation delays caused by late approval by USDOL. 8/26/15 email: "The PCT has its cohort of 10 students for year 1 but renovations on the lab for the skill part has not even started. Students are currently engaging in their English and math courses. Since year 1 ends Sept. 30 and year 2 begins, that places everything off."

Activity 2: Complete curriculum development by building upon established allied health curriculum and implement the Patient Care Technician Program					
Year	Milestones	Deliverables	Date	Status	Evidence
					2015 3rd Qtr. Report: 10 students took Anatomy and Physiology, lab not yet ready.
	i. Enhance recruitment and outreach through marketing strategies			Unk	2015 2nd Qtr. Report: information sessions held to identify potential students
2 10/1/15 to 9/30/16	a. Recruitment and outreach	1. Syllabi and curriculum 2. Student outcomes and comparison data		Unk	As of 11/2016, there is a waitlist for the program.
	b. Review/revise curriculum		2016	Met	Evidence from interviews indicates they made revisions as needed.
	c. Enroll up to 20 students		2016	Met through self report within timeline	2015 2nd Qtr. Report: 20 students identified for Year 2 cohort and started orientation. Year 2 report indicates 20 students enrolled, 20 retained.
3 10/1/16 to 9/30/17	a. Review/revise curriculum	1. Syllabi and curriculum 2. Student outcomes and comparison data 3. Employment tracking data	2017	Met	As of 1/2017, expanded program to Georgetown (Owens) campus. Revisions made as needed
	b. Enroll up to 10 students		2017	Met	2015 3rd Qtr. Report: 10 students identified for Year 3 (there is a waiting list). Year 3 report indicates 11 enrolled, 9 retained.
4 10/1/17 To 9/30/18	a. Follow up only	1. Student outcomes and comparison data 2. Employment tracking data	20148	Met	Evaluator obtained institutional data from DTCC IR office

APPENDIX C: STAFF INTERVIEW PROTOCOL

Organizational Structure/Governance
To start off, I'd like to talk about the organizational structure and governance of the Round 4 TAACCCT grant.

1. **(Year 1 only; ask in subsequent years only if the person was not interviewed in prior years)** To begin, please tell me about your role in the TAACCCT Round 4 grant at DTCC.

   (Years 2-4) What have you been focused on in the past year? In the future?

2. **(Year 1 only)** Can you explain the organizational structure of DTCC's TAACCCT Round 4 grant? *(Probe: implementation of strategies, leadership, administrative structure)*

   (Years 2-4) How is the organizational structure going? (*Probe: Communication, meetings, etc.*)

3. Can you describe any capacity building at DTCC or within your department you expect to see as a result of this grant funding? (*Interviewer: be prepared to define capacity building: PD for staff, new equipment, new curriculum, what has expanded/improved*)

Curriculum Development
Next, I'd like to know more about your curriculum development…

4. (**Year 1 only, possibly Year 2 also**) Has curriculum development started for your program or department?

   4a. *(If yes)* Could you walk me through your curriculum development process*? (Probe: how it was/will be selected/created/used, communication methods, plan for industry alignment, challenges, success)*

   4b. *(If no)* What is your plan for curriculum development? *(Probe: how it was/will be selected/created/used, communication methods, plan for industry alignment)*

   (**Year 3 & 4**) Have there been any changes to the curriculum in the past year? Please explain.

Program Design
Shifting now to the program design…

5. Can you tell me how your program has changed (*e.g., course sequencing, format*) or will change as a result of this grant funding? *(Probe: improvement, expansion, delivery method, administrative structure)*

6. What student support or other services are offered or will be offered as a result of grant funding?

Partner Support
I'd like to know more about partner support…

7. Can you tell me about the contributions that partners have made or are planning to make to the program? *(Probe: factors impacting involvement, most and least critical contributions, challenges, successes, which employers are likely to hire students)*

Conclusion

8.   Do you have any suggestions on what would strengthen the project? *(Draw from negative answers in previous question)*

9.   What is your overall opinion of the TAACCCT Round 4 grant? (*look for answers about program management and implementation and desired impacts on students*)

Questions for Years 3 and 4 only

10. What are your plans for sustaining your program once the grant is over?

Thank you, that's it for my questions. Is there anything you'd like to add that I haven't asked you about?

APPENDIX D: EMPLOYER INTERVIEW PROTOCOL

Background
1. To begin, could you tell me a little about your agency/company? *(Probe: industry, what they do)*

Involvement with DTCC
Next, I'd like to know more about your involvement with DTCC and the TAACCCT Round 4 project…

2. Can you tell me about your company's and your individual relationship with DTCC in regards to the BAS/PCT program? *(Probe: specific program)*

3. Can you describe the contributions your organization has made to the development of the BAS/PCT program? (*Probe: curriculum input, program design, training, equipment, hiring*)?

4. In your opinion, what about the partnership between your organization and DTCC is critical to the success of the BAS/PCT program?

   a. Are there contributions you would like to make, but have not? If yes, please explain.

5. As a partner or potential employer, what is your opinion of the BAS/PCT program at DTCC? *(Probe: strengths and weaknesses, suggestions for improvement)*

Alignment with Industry Needs
Thinking about how the program applies to your needs…

6. How does the BAS/PCT program align with the type of worker you would be interested in hiring? (*Probe: soft skills*)

7. How do the skills taught in the program align with the skills you are looking for in your workers? *(Probe: missing skills, additional job training required, what other employers are looking for)*

8. Have you hired new employees out of the program? *(Probe: Internships, apprenticeship?)*

   a. *If yes,* how has their performance been?

   b. *If no*, why not? Are you considering graduates in the future?

9. Have you recommended any of the available training programs to your current employees? Please explain.

10. What is your overall opinion of the program?

That's it for my questions, is there anything else you'd like to share?

APPENDIX E: STUDENT INTERVIEW PROTOCOL

Background
1. Can you tell me a little about your school and work experiences prior to enrolling in your DTCC program? *(Probe: highest education, prior work field and/or military service, work experience)*

2. What made you want to enroll in the BAS/PCT program? *(Look to see if partners contributed to recruiting)* *(Probe: motivations for enrolling, goals for completion)*

3. Are you still enrolled in the program? *(Probe: why withdrew, plans for finishing, degree/certificate)*

Program Content
4. Did you complete any assessments of your abilities or skills when you first enrolled in the program?

    4a. *If yes*, what assessments/tests did you take?
    4b. *If yes*, could you describe your experiences with those assessments? *(Probe: when taken, where/who administered, impact on enrollment)*

5. Did you receive any career guidance from someone at DTCC?

    5a. *If yes*, how was it provided to you (e.g., in person, virtually)?

6. Did you have any interaction with any employers (e.g., employer presentation, job fair, internship)?

    6a. *If yes*, please describe. How useful were the companies in affecting your training outside of the classroom at DTCC? (e.g., the internship)

7. What kinds of employment opportunities have the employer companies presented to you and your classmates? *(If employment opportunities have not been presented, what type of job do they expect to get?)*

8. Can you describe how the BAS/PCT program is meeting, exceeding, or falling short of your expectations? *(Probe: course topics, difficulty level, instructors)*

Post Completion
9. ***If completed.*** How has the program prepared you for a career in BAS/PCT? *(Probe: skills, career guidance, job search, found employment)*

10. ***If not yet completed.*** Can you describe the ways the program is preparing you for a career in BAS/PCT? *(Probe: skills, career guidance, job search, interactions with local employers)*

11. In what ways were you most impacted by enrolling in the BAS/PCT at DTCC? (*Look for answers related to desired student perceptions.*)

Conclusion
12. What is your overall opinion of the BAS/PCT program?

13. What would you do to improve the program? *(Probe: draw on previous negative answers)*

APPENDIX F: STUDENT FOCUS GROUP PROTOCOL

Background
1. To start off, tell me about your school and work experience prior to enrolling in the PCT program and what motivated you to pursue the program. *(Probe: highest level of education, prior work field and/or military service, years of work experience)*

2. What was the enrollment process like? *(Probe: how they heard about the program, process for applying)*

3. Are you still enrolled in the program? *(Probe: plans for finishing; if completed...when?)*

Program Content
4. Did you complete any assessments of your abilities or skills when you first enrolled in the program? (e.g., placement tests, Accuplacer -determines need for remediation) *(If no, skip to next question)*

   4a. *If yes*, what assessments/tests did you take?
   4b. *If yes*, could you describe your experiences with those assessments? *(Probe: when taken, where/who administered, impact on enrollment)*

5. Did you receive any career guidance from someone at DTCC?

   5a. *If yes*, how was it provided to you (e.g., in person, virtually)?

6. Tell me about your interactions with employers (*Probe: clinicals, employer presentation, job fair, internship*).

   6a. How useful were the organizations in affecting your training outside of the classroom at DTCC? (e.g., clinical)

7. What kinds of employment opportunities have the employer organizations presented to you? (*If employment opportunities have not been presented, what type of job do they expect to get?*)

8. Can you describe how the PCT program is meeting, exceeding, or falling short of your expectations? *(Probe: course topics, difficulty level, instructors)*

Post Completion
9. **If completed.** How has the program prepared you for a career as a PCT?*(Probe: skills; career guidance; job search; found employment; where employed; wage increase, decrease, or the same)*

10. **If not yet completed.** Can you describe the ways the program is preparing you for a career as a PCT? *(Probe: skills; career guidance; job search; interactions with local employers; expect wage increase, decrease, or the same)*

11. In what ways were you most impacted by enrolling in the PCT program at DTCC? (*Look for answers related to desired student perceptions.*)

Conclusion
12. What is your overall opinion of the PCT program?

13. What would you do to improve the program? *(Probe: draw on previous negative answers)*