TAACCCT

Accelerating Wireless Education for Capital and Crater Regions (AWE4CCR)

Final Evaluation Report

9-30-2018

Contents

Executive Summary

TAACCT Program/Intervention Description and Activities

This report describes the activities that occurred during the implementation of the Accelerating Wireless Education for Capital and Crater Regions (AWE4CCR), a Round 4 TAACCCT grant funded by the United States Department of Labor (USDOL). The project endeavored to improve educational training in the wireless telecommunications infrastructure sector, and to the placement of TAA-eligible, unemployed, veterans, and other low-income workers in high-wage, high-skill occupations. A new short-term Wireless Technician program was established, and Bachelor of Science degrees in Project Management, Logistics and Supply Chain, and Enterprise Resource Planning were training options for participants. The project is led by Virginia State University (VSU) with several key partners: Richard Bland College (RBC), which is assigned to assess potential incoming participants for readiness and remediate as necessary; Warriors4Wireless (W4W, which is assigned to recruit veteran to the program and help with advisement during the program and job placement after; local Workforce Investment Boards (WIBs) will connect displaced workers to the program; Wireless Infrastructure Association (WIA) will play an advisory role and be influential in industry partnerships.

The project was organized into six strategies:

Strategy 1: Accelerate Credential Completion to allow students to enter the workforce more quickly by compressing a semester of academic content into fewer weeks of instruction, targeting 8 weeks of training with the Wireless Technician program. The strategy cites moderate evidence from a nursing study that found accelerating the nursing program led to improvements in academic achievement. The strategy is depicted in Figure 1 below.

Strategy 2: Implement New Models of Instruction to Enhance Learning. Training will be delivered utilizing applied, hands-on learning, which is supported by strong evidence from cognitive science research showing the impact of constructing, inventing, and solving problems on learning. This strategy is also depicted in Figure 1.

Strategy 3: Strengthen Online and Technology-Enabled Learning. The first two weeks of the eight weeks of the Wireless Technician program will be delivered online. Other courses and content in other targeted programs are delivered on-line as well. The strategy cites moderate to strong evidence from multiple studies on the usefulness of online learning. This strategy is also depicted in Figure 1.

Strategy 4: Increase Employment Engagement by creating robust sector partnerships that will increase opportunities for students to gain real-life industry experience. Strong evidence for the utility of sector strategies comes from a random assignment study, which found earnings increases for subjects assigned to sector-focused training relative to controls. This strategy is depicted in Figure 2.

Strategy 5: Implement Apprenticeships. Students who complete the program and are hired by industry are typically considered apprentices within the hiring company for a time period ranging from 3 to 6 months. This strategy cites moderate evidence from an apprenticeship study. This strategy is also depicted in Figure 1.

Strategy 6: Student Supports. An ePortfolio for students will be developed to serve as a detailed "resume" reflective of students' skills in wireless industry technologies. This strategy includes readiness assessment and, if necessary, remediation from partner Richard Bland College. This strategy is depicted in Figure 3.

Evaluation Design Summary

Goals of the Evaluation

- The implementation evaluation has two goals: (1) to assess fidelity to the original proposal's intent, and (2) to identify factors affecting outcomes.

- The primary goal of the Impact Evaluation was to determine the impacts of the new Certificate for Wireless Technician training program on participant certificate completion, credit attainment, and job attainment and retention. Three other training programs were targeted by the project, as described below. Impacts related to these programs also are provided in the Impact Evaluation.

Implementation Study Design
1. Implementation Research Questions: Broadly, the implementation evaluation sought the following:
   - 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 model? When variation exists, is it effective and consistent with project outcomes?
   - What activities and factors affect the effectiveness of the project?
   - Were the partners able to establish sector partnerships and apprenticeships with employers?
   - Were student supports provided and were they effective?
   - Were partnerships effective and what were the contributions of partners to: program design, (2) curriculum development, (3) recruitment, (4) training, (5) placement, (6) program management, (7) leveraging of resources, and (8) program sustainability?
2. Conceptual framework of implementation study: The implementation evaluation is organized around the conceptual framework depicted in the logic models below.
3. Conceptual framework informs the analysis: Inquiries were organized to investigate key topics depicted in the logic models. These include program design models, student supports and employer engagement.
4. Implementation data and methods: Evaluation activities involved communicating with local project staff and instructors, students, and/or employers and included: (1) interviews, and (2) surveys. Assessment of progress measures or benchmarks required in the original grant proposal or Virginia State University leadership are embedded in the activities.

Impact Study Design
1. Impact Analysis Research Questions: The outcomes/impact research questions incorporate the DOL reporting requirements for the Annual Performance Report. For each question listed, we are comparing grant participants in the AWE4CCR-affected programs of study to comparison group individuals:
   a. How many unique participants/comparisons have been served?
   b. How many individuals have completed a grant/comparison program of study?
      i. Of those, how many are incumbent workers?
   c. How many individuals are still retained in their program of study (or other grant-funded program)?
   d. How many individuals are retained in other education programs?
   e. How many credit hours have been completed?
      i. How many students have completed credit hours?
   f. How many credentials have been earned by participants/ comparisons?
      i. How many students have earned certificates (<1 year)?
      ii. How many students have earned certificates (>1 year)?
      iii. How many students have earned degrees?
   g. How many students are pursuing further education after program of study completion?

h. How many participants/comparisons are employed after program of study completion?
i. How many participants/ comparisons are retained in employment for three quarters after program of study completion?
j. What are the wages of participants/ comparisons relative to before enrollment?
    i. How many of those employed at enrollment received a wage increase post-enrollment?

2. Design Methodology: A random-assignment research design was impractical for the proposed program. Randomly assigning students to either a treatment or control group is resource-intensive and would jeopardize the successful implementation of the programs. Thus, a quasi-experimental approach was deemed the most practical way to assess the impacts of the intervention. The evaluation was constructed by collecting and analyzing data for each grant-affected program of the college. In addition, each grant-affected program was compared to a similar comparison program. Comparison program data was provided by another college with similar training programs. Comparability of the comparison program to the grant program is based on similarities in program structure (such as department, credit/non-credit status, and program size and duration) and student demographics (such as race, gender, and age).

3. Data Used and Its Reliability: Data comes from different sources:
    a. College Student Information System:
        i. On an ongoing basis, VSU submitted data on their students, including information such as completions.
        ii. Once per student, VSU submitted data on students that did not change over time, such as gender, race, and date of birth.
    b. Post-Completion Surveys were distributed to participants after completion of a grant-affected program inquiring about changes in employment and wages pre-, during, and post-program completion.
    c. Employment and wage information was collected from the state wage agency, the Virginia Employment Commission.

Data was collected from each source as it became available on a rolling basis. VSU collected data on participant two times per year – once in the fall reflecting the previous summer and spring terms, once in the spring reflecting the previous fall term. Comparison data was gathered from a similar college offering similar training programs. State wage data was collected as needed and encompass the quarters that are available from the state agency at the time of the data pull. The data included in this report has been collected based on research questions referenced above. The data is considered to be reliable. College data is part of the ongoing business of an institution of higher learning, and given the relatively simple nature of the college data required, this data is considered reliable. Lastly, there are no indications of systematic inaccuracies in the state wage data.

Implementation Findings
What is being implemented, and how is it theorized to drive impacts?
The AWE4CCR project was designed to address several identified gaps: 1) wireless industry's growing demand for trained technicians and other skilled workers, 2) the region's education system not able to meet the industry's needs for trained workers, and 3) thousands of veterans and soldiers in the region needing employment opportunities. To address these gaps, AWE4CCR provided several training programs, focusing on an entry-level Wireless Technician program primarily. To drive completion of training by participants and help completers enter employment in the wireless infrastructure industry several strategies were employed: compressed courses, on-line and hands-on learning, employer

engagement and apprenticeships, and participant supports. Logic models of the strategies are provided below and offer more details on how these strategies are theorized to drive impact to address the project's identified gaps.

Did implementation occur on time and as intended?
Implementation was delayed for almost a year due to VSU requesting to move the grant award from the VSU Foundation, the entity that was originally awarded the grant, to the VSU Office of Projects and Grants. USDOL approved the move but it was well into the first year of the grant before approval was granted. Even after all project components were put in place, implementation was slowed considerably due to challenges related to recruitment of students and outdated curriculum content especially for the Wireless Technician program, which are documented below. Once these early challenges were addressed, implementation proceeded as expected but the delays had a significant lasting impact on project outcomes.

Is there fidelity to the model? When variation exists, is it effective and consistent with project outcomes?
There was substantial fidelity to the model in most respects. Parts of the curriculum of all grant-targeted programs were compressed to expedite credential completion, and on-line instruction was incorporated into curriculum courses and content. Hands-on learning was incorporated into the Wireless Technician program, whereby students spent considered time interacting with wireless towers and other actual work environment equipment. Employer engagement remained strong throughout the grant, but "apprenticeship" type relations with employers were never established. Employers hired credential completers but there was no formal apprenticeship relationship with employers either pre- or post-employment.

What activities and factors affect the effectiveness of the project?
The late start noted above affected project effectiveness, leaving less time to operate the grant programming and serve participants. The most significant factor affecting effectiveness was a constant struggle with recruiting targeted participants (veterans especially). Participant recruiting partnerships with external organizations were not effective and partners dropped out of the project. Additionally, potential participants were concerned about certain features of the Wireless Technical program in particular (length of time to complete, on-campus housing requirement). VSU eventually received USDOL approval to recruit a broader population of students from within the college, and changes were made to the Wireless Technician curriculum to better appeal to prospective participants. Compounding the curriculum challenges was the wireless infrastructure industry development that the demand for wireless tower technicians was waning, thus making the Wireless Technician curriculum in need of updating. WIA and employer partners worked with VSU to update the curriculum and put emphasis on a second tier of the Wireless Technician curriculum, but industry demand for these worker skills still remained far below demand when the grant was developed. All these challenges significantly affected participant recruitment and delayed project implementation.

Were the partners able to establish sector partnerships and apprenticeships with employers?
A Sector partnership, the definition of which can vary, was established on a very basic level. Specific employers and the Wireless Infrastructure Association (WIA) where engaged in the project throughout. These employers provided input on curriculum via advisory boards and hired credential completers. As noted apprenticeships were not established.

Were student supports provided and were they effective?

Students were provided access to ePortfolio's to serve as virtual resumes to communicate participant's skills learned and credentials earned to prospective employers. Basic skill assessments were conducted by Richard Bland College to determine any basic skill instructional support prospective students might need, and the college delivered such support when needed, as described in the project model.

<u>Were partnerships effective and what were the contributions of partners?</u>
AWE4CCR involved partnerships with several organizations, as noted. The partners primarily responsible for helping recruit targeted participants were not effective and these partners, namely Warrior4Wireless and the Crater Regional Workforce Group, dropped out of the project. Partnerships with employers and with Richard Bland College were effective. Contributions of these partners are noted above.

Participant Impacts and Outcomes
The impact research questions are based on the DOL reporting requirements for the annual performance report. Given the limitations in data availability some questions were answerable to a greater or lesser extent. Here are direct answers to the questions posed in the evaluation plan. Further analysis in included in the Impact Evaluation section later in the report.

1. How many unique participants have been served?

In total, 253 participants were served by the grant.

2. How many individuals have completed the grant program of study?
    a. Of those, how many are incumbent workers?

Over the course of the grant, 191 participants completed a grant-affected program of study (70 of whom were incumbent workers). The completion rate for participants was generally similar to, or greater than, the completion rate for comparison individuals on a program-by-program basis.

3. How many individuals are still retained in their program of study (or other grant-funded program)?

43 participants were still continuing with their grant-affected program of study at the completion of the grant.

4. How many individuals are retained in other education programs?

0 participants were retained in other education programs.

5. How many credit hours have been completed?
    a. How many students have completed credit hours?

2289 credit hours were completed by 248 participants.

6. How many credentials have been earned by participants?
    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?

Participants earned 222 certificates over the course of the grant, all at the short-term level.

7. How many students are pursuing further education after program of study completion?

Of those who completed a grant-affected program of study, 10 continued on to further education after completion.

8. How many participants are employed after program of study completion?

Of those who were non-incumbent workers at the time of enrollment, 31 participants who completed a grant-affected program gained employment in the semester after completion.

9. How many participants are retained in employment for three quarters after program of study completion?

Of those 31 employed, 13 were retained in employment through quarters two and three after completion.

10. What are the wages of participants relative to before enrollment?

a. How many of those employed at enrollment received a wage increase post-enrollment?
Of those who were employed at enrollment, 60 earned a wage increase in their employment.

<u>Additional Findings</u>
In regards to the employment and employment retention numbers, many participants were still enrolled in training programs and not yet completers looking for employment. The shift in emphasis to longer-term degree programs for participants, as noted, instead of the shorter-term Wireless Technician program which was the original emphasis of the project, contributed to this number of incompletions as of the final reporting deadline for the project. Additionally, 70 of the 191 completers were incumbent workers and thus ineligible under USDOL guidelines for counting toward post-completion employment. Of the remaining 121 completers eligible to count toward post-completion employment, 45 were still enrolled in school in Spring 2018 (the end of the grant). Of the remaining 76 completers eligible to count toward post-completion employment, 31 were employed (plus an additional 10 participants pursued further education). So over 40% of non-incumbent worker participants that completed a program by the Fall 2017 semester found employment in the quarter after program completion.

Conclusions
The AWE4CCR project and the training programs it offered did begin to address the workforce system gaps the project was intended to address. A new Wireless Technician program was established, and Bachelor of Science degrees in Project Management, Logistics and Supply Chain, and Enterprise Resource Planning were training options for participants. As envisioned, veterans and soldiers completed these programs, although not at rates as high as expected (only 11%). AWE4CCR partners charged with recruiting veterans and other target participants (e.g., dislocated workers) were not effective and those partnerships were discontinued, which resulted in on-going challenges with recruiting targeted participants. AWE4CCR encountered significant early challenges including with the curriculum design of the Wireless Technician program which inhibited participant recruitment throughout the project. VSU eventually sought and USDOL approved a grant modification to recruit among students enrolling in VSU, and that improved recruitment and enrollment, although this change did not take effect until about year 3 of the project. In the end, AWE4CCR enrolled 253 participants, and had 191 completers who earned a total of 222 credentials. The original grant proposal projected over 400 participants. Considering the significant implementation challenges described in this report, 253 participants is better than would be expected. Other participant outcomes fell short, not surprisingly, including employment outcomes. Employment outcomes were affected because of the change in industry skill needs that kept the Wireless Technician training less in demand by employers despite curricular modifications to address this, and the subsequent shift to participant enrollment in more-needed, longer-term degree programs which have not yet been completed by a significant number of participants. Described implementation delays also meant that many participants enrolled in these longer-term degree programs in the third year of the grant, compounding the number of participants not yet completing. Many participants were also incumbent workers employed upon enrollment and thus could not be included in post-completion employment outcomes as defined by USDOL. The participant recruitment challenges, in addition to changing industry workforce skill needs, as noted had a very significant impact on participant enrollment and all subsequent project outcomes. On a more positive note the comparison program outcomes data indicates AWE4CCR participants had better outcomes for many specific outcome measures than the comparison program participants.

Introduction to TAACCCT

Through the Trade Adjustment Assistance Community College Career Training (TAACCCT) program, the United States Department of Labor (USDOL), in partnership with the Department of Education, assisted the nation's institutions of higher education in helping adults succeed by acquiring the skills, degrees, and credentials needed for high-wage, high-skill employment while also meeting the demands of employers for skilled workers. TAACCCT provides eligible institutions of higher education with multi-year grants to expand and improve their ability to deliver education and career training programs that can be completed in two years or less, are suited for workers who are eligible for training under the TAA for Workers program, and prepare program participants for employment in high-wage, high-skill occupations.

The Accelerating Wireless Education for Capital and Crater Regions (AWE4CCR) project of Virginia State University, was awarded a TAACCT grant in the Fall of 2014 to train 420 workers for jobs in the wireless infrastructure industry for a performance period October 1 of 2014 to March 31 of 2018. The following pages describe the project as envisioned, its implementation, and impact.

Project Description

The Accelerating Wireless Education for Capital and Crater Regions (AWE4CCR) project is committed to improving educational training in the wireless telecommunications sector, and dedicated to the placement of TAA-eligible, unemployed, veterans, and other low-income workers in high-wage, high-skill occupations. The project is led by Virginia State University (VSU) with several key partnerships integral to success, including: Richard Bland College (RBC), which is assigned to assess potential incoming participants for readiness and remediate as necessary; Warriors4Wireless (W4W, which is assigned to recruit veteran to the program and help with advisement during the program and job placement after; local Workforce Investment Boards (WIBs) will connect displaced workers to the program; Wireless Infrastructure Association (WIA) will play an advisory role and be influential in industry partnerships.

The central activity in this project is the creation of an 8-week training program for wireless technicians including elements of accelerated credential completion (Strategy 1), implementation of new models of instruction to enhance learning (Strategy 2), strengthening of online and technology-enabled learning (Strategy 3), and implementation of apprenticeships (Strategy 5). Additionally, a set of grant activities (Strategy 4) is dedicated to aligning the content of the program with the needs of employers in the region. Another set of activities (Strategy 6) is dedicated to building and improving student supports. More detail is provided on these strategies below.

As described in more detail in the sections below, all strategies are evaluated in the Implementation Evaluation and the impacts on defined USDOL outcomes are evaluated in the Impact Evaluation.

The strategies are aimed at addressing several gaps:

- Gap 1: The telecommunication industry's growing demand for trained technicians and other positions to implement and maintain wireless infrastructure investments, which are projected to average around $35 billion in each of the next five years.
- Gap 2: Despite exponential industry growth, the region's education systems have not kept pace. No schools in the area offer wireless technician training.

- Gap 3: The region is home to Fort Lee, the US Army's Combined Arms Support Command. Fort Lee is expanding as a result of Base Realignment and Closure (BRAC) and is home to thousands of soldiers in need of employment opportunities.

Six strategies are proposed in the grant:

Strategy 1: Accelerate Credential Completion. This strategy is designed to allow students to enter the workforce more quickly by spending less time in a training program. The strategy cites moderate evidence from a nursing study that found accelerating the nursing program led to improvements in academic achievement. Depicted in Figure 1, the strategy compresses a semester's worth of academic content into an 8-week training program.

Strategy 2: Implement New Models of Instruction to Enhance Learning. This strategy represents a part of the execution of Strategy 1. The compressed program will be delivered utilizing applied, hands-on learning, which is supported by strong evidence from cognitive science research showing the impact of constructing, inventing, and solving problems on learning. This strategy is also depicted in Figure 1.

Strategy 3: Strengthen Online and Technology-Enabled Learning. This strategy represents a part of the execution of Strategy 1. The first two weeks of the eight weeks of the program will be delivered online. The strategy cites moderate to strong evidence from multiple studies on the usefulness of online learning. This strategy is also depicted in Figure 1.

Strategy 4: Increase Employment Engagement. This strategy will work with partner Corporation for a Skilled Workforce (CSW) to create robust sector partnerships that will increase opportunities for students to gain real-life industry experience. Strong evidence for the utility of sector strategies comes from a random assignment study, which found earnings increases for subjects assigned to sector-focused training relative to controls. This strategy is depicted in Figure 2.

Strategy 5: Implement Apprenticeships. This strategy represents a part of the execution of Strategy 1. Students who complete the program and are hired by industry are typically considered apprentices within the hiring company for a time period ranging from 3 to 6 months, so the program provides a direct path to apprenticeship for program completers. This strategy cites moderate evidence from an apprenticeship study. This strategy is also depicted in Figure 1.

Strategy 6: Student Supports. This strategy includes the development of an ePortfolio for students, which will serve as a detailed "resume" reflective of their skills in wireless technologies. Also, this strategy includes readiness assessment and, if necessary, remediation from partner Richard Bland College. This strategy is depicted in Figure 3.

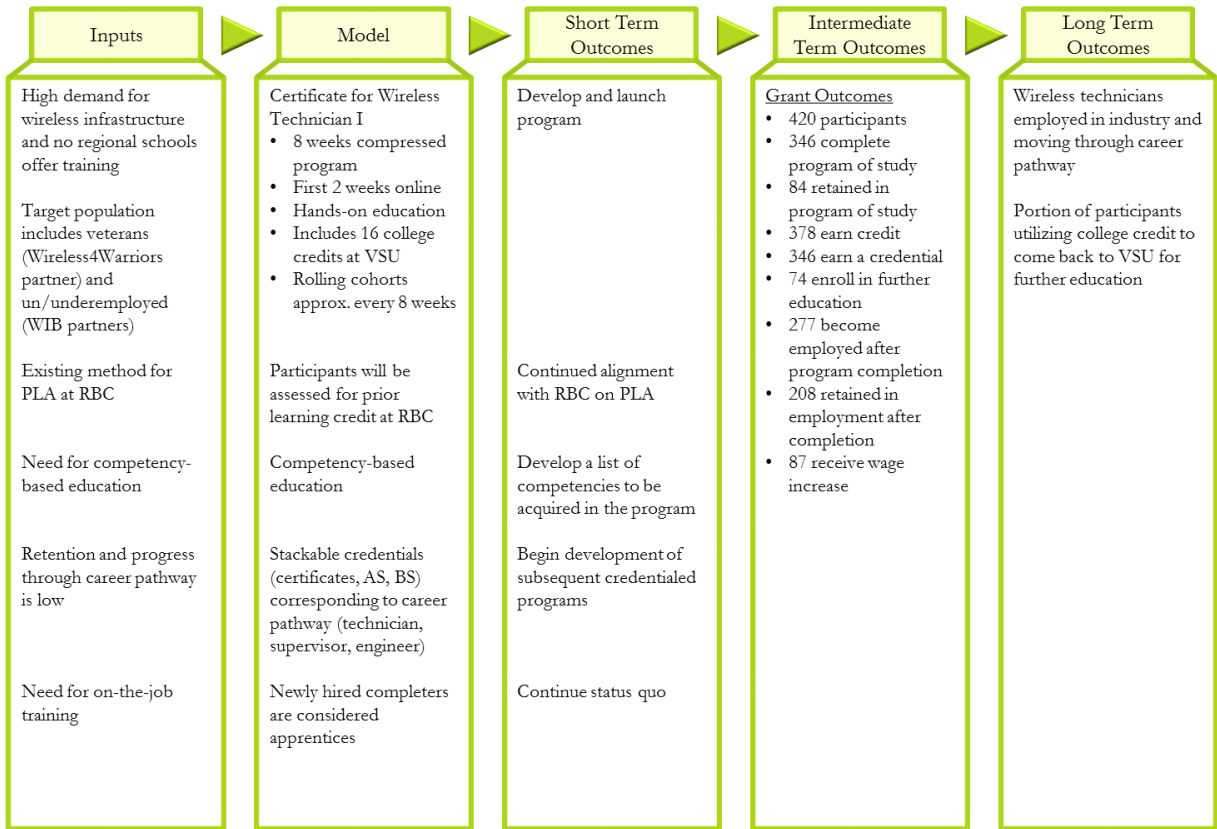Figure 1: Logic Model for Strategies 1, 2, 3, and 5

Inputs	Model	Short Term Outcomes	Intermediate Term Outcomes	Long Term Outcomes
High demand for wireless infrastructure and no regional schools offer training Target population includes veterans (Wireless4Warriors partner) and un/underemployed (WIB partners) Existing method for PLA at RBC Need for competency-based education Retention and progress through career pathway is low Need for on-the-job training	Certificate for Wireless Technician I • 8 weeks compressed program • First 2 weeks online • Hands-on education • Includes 16 college credits at VSU • Rolling cohorts approx. every 8 weeks Participants will be assessed for prior learning credit at RBC Competency-based education Stackable credentials (certificates, AS, BS) corresponding to career pathway (technician, supervisor, engineer) Newly hired completers are considered apprentices	Develop and launch program Continued alignment with RBC on PLA Develop a list of competencies to be acquired in the program Begin development of subsequent credentialed programs Continue status quo	Grant Outcomes • 420 participants • 346 complete program of study • 84 retained in program of study • 378 earn credit • 346 earn a credential • 74 enroll in further education • 277 become employed after program completion • 208 retained in employment after completion • 87 receive wage increase	Wireless technicians employed in industry and moving through career pathway Portion of participants utilizing college credit to come back to VSU for further education

Figure 2: Logic Model for Strategy 4

Inputs	Model	Short Term Outcomes	Intermediate Term Outcomes	Long Term Outcomes
Connections with businesses have the potential to be strengthened	Sector strategies (retain CSW to help create robust sector partnerships)	Sector partnerships formed	Programs and services are designed/adjusted around employer needs	Vision • VSU aligning wireless training with needs of employers • External partnerships are expanded to facilitate a broader and more strategic array of programs, services, and resources

Figure 3: Logic Model for Strategy 6

Inputs	Model	Short Term Outcomes	Intermediate Term Outcomes	Long Term Outcomes
Need for student and employer to know what student really knows

Target population at risk to be underprepared | Student ePortfolio serves as a "detailed wireless resume"

RBC evaluates potential participants for readiness and remediates as needed using Plugged In Virginia (PIVA) | ePortfolio created

Funnel from target population to program established | ePortfolio functioning and informing students and employers

Program meeting enrollment goals | Vision
• Programs and services support student success |
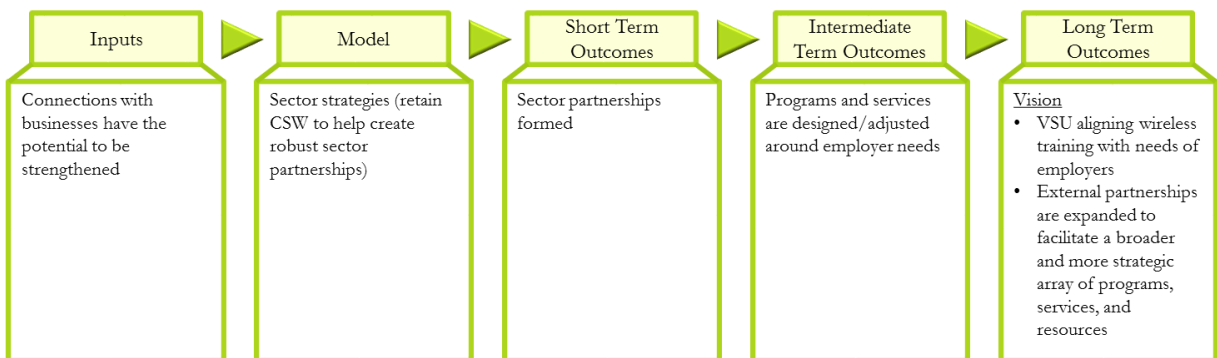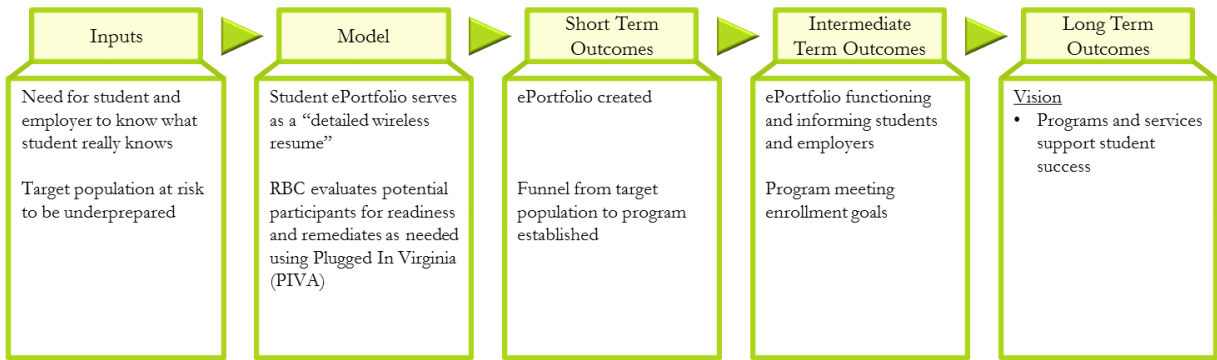
Evaluation Research Design and Methodologies

There are two parts to the evaluation: (1) an implementation evaluation that captures the details of project implementation and the extent to which the colleges implemented according to the original blueprint of the project; and (2) an impact evaluation that captures the impacts of grant activities on participant earnings, job attainment, employment intensity, wages, and likelihood of working in a job that offers benefits (e.g., health insurance) along with program retention and completion using a comparison approach.

Implementation Analysis Design

The implementation evaluation has two goals: (1) to assess fidelity to the intent, and (2) to identify factors affecting outcomes. To assess fidelity to the intent of the project, the evaluation team benchmarked the implementation of the project against the grant and logic models using survey and interview techniques. The second goal of capturing factors that affect outcomes was assessed through inquiries seeking to identify and capture enabling or hindering factors affecting progress and participant outcomes.

Implementation Analysis Research Questions

Broadly, the implementation evaluation seeks to capture the following:
- 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 model? When variation exists, is it effective and consistent with project outcomes?

Specific questions pertaining to each grant strategy are posed, as follows:
- Strategies 1, 2, 3, and 5:
    - What factors enabled or hindered the following: program completion, employment attainment, employment retention, and participant earnings?
- Strategy 4:
    - Were the partners able to establish sector partnerships enabling employers to convey their workforce needs and the partners to implement and improve the program to meet those needs?
- Strategy 6:
    - Is the ePortfolio functioning to inform students and employers about wireless skills and capabilities?
    - Is the funnel from target populations to program enrollment meeting enrollment goals?

Questions posed in the original proposed evaluation plan were incorporated:
- How curricula were selected, used, or created?
- How was the program designed using grant funds? What delivery method was offered? What was the program administrative structure? What support services and other services were offered?
- Did grantees conduct an in-depth assessment of participant's abilities, skills, and interests to select participants into the grant program? What assessment tools and processes were used? Who conducted the assessment? How were the assessment results used? Were the assessment results useful in determining the appropriate path for participants? Was career guidance provided and, if so, through what methods?

- What contributions did each of the partners and other key stakeholders make towards: 1) program design, 2) curriculum development, 3) recruitment, 4) training, 5) placement, 6) program management, 7) leveraging of resources, and 8) commitment to program sustainability? What factors contributed to partners' involvement or lack of involvement in the program? Which contributions from partners were most critical to the success of the grant program? Which contributions from partners had less of an impact?

Implementation Analysis Data Strategies

Implementation evaluation activities involved local project staff and instructors, project leadership, and/or employers and included: (1) interviews, and (2) surveys.

Impact Evaluation Design

The primary goal of the Impact Evaluation was to determine the impacts of the grant-affected programs on participant certificate completion, credit attainment, and job attainment, earnings, and retention.

For each grant-affected program, at least one comparable comparison group was identified. Then, for the comparison group, the comparability of individuals to program individuals was established. Initially, a quasi-experimental approach was constructed. However, the comparison analysis evolved as the grant evolved. The following section details the comparison strategy in more detail.

Comparison Analysis

There were difficulties identifying a comparison group for the evaluation for numerous reasons:

- The original recruitment and enrollment strategy for the project was as follows:
    1. W4W would attract veterans
    2. W4W would assess the veterans for interest in the wireless technician program and pass them along to the local WIB
    3. The WIB would then screen all interested individuals for inclusion into the program and administer PIFs
    4. Those that were not interested in the Wireless Technician program would be considered as the comparison group.

    Due to lower than expected enrollment in the Wireless Technician program, for reasons noted, there was not enough overflow at the WIB to create a comparison program.

- Since the programs were newly created with grant funds, a historical comparison group at VSU was not an option.
- Since it is traditionally a four-year institution, short-term credential programs similar to those created with TAACCCT dollars do not exist at VSU, eliminating the option of a parallel comparison group within the institution.

The evaluation team reached out to surrounding educational institutions with short-term programs to identify a comparison program. Northern Virginia Community College's (NOVA) Workforce Development Department featured programs similar in program type and duration, and were willing to supply aggregate data. NOVA submitted aggregate data for the following programs:

- Project Management Short-Term Certificate
- Database Administrator Short-Term Certificate
- Federal Contract Management Short-Term Certificate
- Cisco Networking/CCNA Preparation Short-Term Certificate

Outcome/Impact Analysis Research Questions

The impact research questions incorporate the DOL reporting requirements for the Annual Performance Report. For each question listed, grant participants in grant-affected programs were compared to comparison group individuals:

1. How many unique participants/comparisons have been served?
2. How many individuals have completed the 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 wages of participants/comparisons relative to before enrollment?
    a. How many of those employed at enrollment received a wage increase post-enrollment?

For each research question, a metric was defined that was used to answer that question. The definitions given are from the point of view of the grant participants. Corresponding definitions exist where relevant for the comparison individuals (the "comparison group") and are not repeated here for brevity. For the outcomes that correspond to one of the 9 DOL outcomes, that DOL outcome number is noted.

Table 1: Outcomes Definitions

Outcome	Definition
Participants	Number of individuals who enroll in a grant-affected program of study. (DOL#1)
Completion Rate	Number of students who complete / participants (DOL#2)
Incumbent Completion Rate	Number of students who complete / participants (numerator and denominator restricted to incumbents)
Retention Rate	Number of students who are retained in their program of study (or other grant program) / participants per reporting period (DOL#3)
Other Retention Rate	Number of students who are retained in another program of study (non-grant) / participants
Credit Hour Completion Amount	Number of credit hours earned per student
Credit Hour Completion Rate	Number of students who complete a credit hour /participants (DOL#4)
Credential Amount	Number of credentials earned per student
Short-Term Credential Rate	Number of students who earn a credential (<=1y) / participants
Long-Term Credential Rate	Number of students who earn a credential (>1y) / participants
Degree Rate	Number of students who earn a degree / participants (DOL#5 = 'a' or 'b' or 'c')

Further Education Rate	Number of students entering further education program after completion / completers (DOL#6)
Employment Rate	Number of students employed / completers (numerator and denominator restricted to non-incumbents) (DOL#7)
Retain Employment Rate	Number of students retained in employment for 2nd and 3rd quarters after completion / completers (numerator and denominator restricted to non-incumbents) (DOL#8)
Wage Increase Amount	Average wage increase after program completion
Wage Increase Rate	Number of students who received quarterly wage increase after enrollment relative to prior to program entry / participants (numerator and denominator restricted to incumbents) (DOL#9)

Implementation Evaluation Report

This section of the report details New Growth's findings for the implementation evaluation. Findings are reported in five sections:

    (1) Implementation inquiries to-date,
    (2) Implementation of grant strategies, and fidelity to the model
    (3) Inquiry themes, and factors affecting outcomes
    (4) Implementation evaluation limitations

Implementation Inquiries

The implementation evaluation seeks to assess fidelity to the intent of the grant, and identify factors affecting the grant outcomes. The findings detailed in this section are based on themed inquiries conducted via interviews with grant management and implementation staff, and grant external partner organizations. Details of implementation evaluation inquiries conducted are below:

Fall 2015	- Initial introductory calls with grant management staff at VSU and grant partner organizations. Themes: Implementation evaluation overview and planned activities, and grant planning stage reflections.
Spring 2016	- Interviews with grant management staff at VSU and grant partner organizations. Themes: External partnerships, and student pipeline analysis.
Fall 2016	- Check in call with grant management staff at VSU. Themes: External partnership update, and changes in grant strategies due to challenges identified in spring interviews related to external partnerships and pipeline analysis.
Spring 2107	- Check in call with grant management staff at VSU. Themes: External partnerships, student recruitment, fidelity and changes to grant strategies.
Fall 2017	- Check in call with grant management staff at VSU. Themes: External partnerships, student recruitment, fidelity and changes to grant strategies.
Spring 2018	- Interviews with grant management staff at VSU and grant partner organizations. Themes: Final assessment of fidelity to grant strategies, and grant performance.

Implementation of Grant Strategies

Delays in implementation of project strategies were experienced, as noted below in more detail, particularly early in the implementation process due to grant changes that required USDOL approval. Further challenges described below also slowed implementation, but nonetheless it is clear that most of the grant strategies were eventually implemented, and therefore there is significant fidelity to the intervention model. During the initial interviews, VSU and all the external partners verified their understanding of and role in implementing each of the grant strategies. All of the partnering organizations reported being engaged in the planning phase of implementing the grant strategies and making progress toward being ready to implement the strategies. The second round of inquiries took place after the initial cohort of students were served, and therefore yielded deeper insights into the implementation of the grant strategies. More specifically, VSU and its partners developed as part of the Wireless Technician program, a 9 week *accelerated curriculum*. The curriculum starts with four weeks of

up-front foundational academic preparation, followed by occupational training to be a wireless and/or cellular infrastructure maintenance technician. In addition to the short-term Wireless Technician program, participant can enroll in Bachelor of Science degree programs in Project Management, Logistics and Supply Chain, and Enterprise Resource Planning, all of which offer compressed courses as part of the curricula. Students can add several industry certifications to these programs to advance their education and training, including an Enterprise System certification and a Project Management certification. The following link provides access to more detailed descriptions of the curriculum VSU developed and the skills and abilities students acquire through those curriculums: http://wirelessu.net/wireless-career-paths/. VSU employed *hands on learning* instructional methods for the Wireless Technician program, and created state of the art classroom and lab settings to deliver this kind of instruction. VSU also *utilized on-line technology* for all targeted programs to enhance certain instructional components. *Employer engagement* was evident by the active participation of the Wireless Infrastructure Association (WIA, formerly PCIA) throughout the grant. WIA was very active in developing the Wireless Technician program training curriculum, and taking the lead on making early changes to the curriculum. WIA was poised to help with job placement of trained individuals, and did, but the numbers of students recruited and graduated was not as robust as intended in part due to changing skill needs of the industry as noted. All early graduates were reported to be employed, at least according to interviews with external partners and the VSU grant management team, but the extent to which they entered into an "*apprenticeship*" type relationship with those employers was not clear because the question has not yet been explored. An *e-portfolio* was established for students, which will serve as resume type tool to capture these completers continued learning and skills relevant to employment and career advancement in the wireless technology industry.

Implementation Themes and Factors Affecting Outcomes

Implementation Delays
Delays in implementation of project strategies were experienced, particularly early in the implementation process. To start, VSU needed to change the grant award entity from the VSU Foundation, the entity originally awarded the grant, to the VSU Office of Projects and Grants. USDOL did approve the change but not until well into the first year of the grant. VSU began project implementation during the time it took to get the change approved, but full-scale planning was not implemented due to uncertainty over the whether the change would be approved. No grant funds could be expended during this time as well. Other challenges that led to further delays in implementation are described below.

Student Recruitment and Enrollment Challenges
External organization partnerships were critical to making AWE4CCR a success because of the very select group of participants targeted, namely veterans and dislocated workers, who can be a relatively difficult population to recruit. Early on, the implementation evaluation focused on student recruitment and enrollment, and in retrospect that was fortunate because some significant challenges to participant recruitment and ultimately the success of the grant emerged.

First, there were delays in marketing the Wireless Technician program. The marketing challenges included having less time to develop marketing strategies and materials because it took longer to get the program ready for launch, and subsequently limited time to actually recruit the first cohort because of the delays. Marketing and recruiting were difficult because the career paths and specific jobs targeted by the Wireless Technician program were changing due to industry changes as noted. These issues were addressed through curricular changes to the Wireless Technician program that broaden the job opportunities and career paths available to completers, but as described below fast-paced industry

changes related to worker skill needs hampered employer demand for completers throughout the project.

There was a perception among some project partners that the primary recruiting organization, Warriors4Wireless, was not performing as expected with regard to recruiting veterans and current military personnel. Possible reasons offered for were the organization's unfamiliarity with the region including local military installations such as Fort Lee, inadequate local staff presence to do outreach and recruiting, and staffing changes at the recruiting position. Warriors4Wireless acknowledged challenges with the initial person hired to do recruiting, and replaced the initial hire. Steps were taken to involve more external partner organizations in recruiting students, including the Crater Regional Workforce Group.

Another factor identified as hindering recruiting for the Wireless Technician program was the reality that many potential participants are not able to train for nine weeks before getting a job. The fact that some potential participants had to travel many miles for an orientation for the training program before actual training even began, only exacerbated the time involved and further complicated recruitment. It was universal sentiment among project partners that most veterans who have completed their service cannot afford to train for nine weeks without employment or some other income. Recruitment efforts shifted to try to recruit participants before they finish their military service so that income is still being provided by the military while participants complete training. Military rules are now more permissive of allowing to-be veterans to participate in work and training prior to release from the military. Despite these identified changes, they were never implemented fully because W4W soon dropped out of participating in the project. Recruitment of veterans, needless to say, continued to be a challenge throughout the grant. In the end 11% of participants were veterans. Similar challenges were experienced with the Crater Regional Workforce Group, which was suppose to help with overall recruitment of participants and especially dislocated workers. The partnership presented challenges, as described below, and eventually the Crater Regional Workforce Group also dropped out of the project. Consequently only 2% of project participants were dislocated workers.

The requirement of living on campus was mentioned as a challenge to recruiting as well. Many potential participants already have housing and/or have families. Finally, financial aid options were also noted as a recruiting challenge. Federal financial aid eligibility was complicated, and other expected sources of financial aid such as GI Bill and WOIA were not as available as expected. Financial aid options and eligibility were better coordinated on the front end for potential students which seemed to help enhance recruiting and enrollment.

Eventually VSU sought a grant modification from USDOL to include new target populations for recruiting potential participants. VSU was approved to recruit from among students entering VSU, and this ability improved recruitment and ultimately enrollment. The flip side of this was that many of these students were interested in the longer-term Bachelor of Science degree programs that were included in the project's targeted training programs. Enrollment in these programs of course impacted participant completion of credentials, and other project outcomes notably employment outcomes.

Changing Industry Skill Needs and Needed Curriculum Changes with Wireless Technician Program
Recruitment was further hindered by wireless infrastructure industry changes which required changes to the Wireless Technician program curriculum. The Wireless Technician program was the primary focus of the project. This was a new short-term program that was going to enabled targeted participant populations to make a relatively quick transition to employment. However, the curriculum encountered several early challenges and never fully recovered to be in high demand within the wireless infrastructure industry.

Some felt the content of the first seven weeks of training was not overly valuable, and that there was an overemphasis on awarding college credit and conforming to the length of a traditional college semester which unnecessarily added to the length of the training. The first seven weeks of foundational training was reduced to four weeks, and additional vocational content was added to the available curriculum as noted above. As mentioned, many potential participants need a shorter training time (less than nine weeks) so that they can find a job more quickly.

Additionally, the curriculum content was quickly outdated as the wireless industry had evolved since the beginning of the grant, and thus "tower" technicians are not as in demand. Because of this very rapid industry change there was a consensus that the curriculum needed revamped to train for a wider variety of wireless technology jobs, including technicians who could install and maintain antenna-based wireless network infrastructure, which in turn would help boost recruitment. To that end, the curriculum emphasized more of the second tier of content within the Wireless Technician curriculum and two optional industry certifications. The curricular changes helped with student recruiting, but even with these changes the demand for even this revised kind of training within the wireless infrastructure industry just never recovered to pre-project levels. Thus recruitment into the Wireless Technician program was affected throughout the project.

Partner Organization Challenges
There was quite a bit of frustration on the part of the partner organization Warriors4Wireless early in the project implementation. This had to do with staffing challenges, and possibly the other reasons noted above. But W4W maintained that the Wireless Technician program was hard to recruit veterans for as designed in terms of time required to complete, resident housing requirement, etc. Regardless of the causes, New Growth observed early in the implementation evaluation that the relationship with Warriors4Wireless needed to be proactively addressed so that grant performance could be improved moving forward, and the VSU grant management team tried to address the issue. These efforts did not yield any improvement in the partnership and thus early in the second year of the project W4W dropped out of the project partnership. This, as noted, hampered recruitment of veterans throughout the remainder of the project.

A similar experience happened with the Crater Regional Workforce Group. They too dropped out of the project in the second year of implementation. Attempts by New Growth to contact the Crater Regional Workforce Group were unsuccessful and so the explanations for their departure are not clear. VSU project management noted frustration with the recruiting efforts of the Crater Regional Workforce Group not yielding project participants.

Partnerships with WIA, the Wireless Infrastructure Association, and specific employer partners such as Shenandoah Towers, Verizon, and AT&T were effective throughout the project.

Impact Evaluation

Impact Evaluation Summary

The primary goal of the Impact Analysis portion of the evaluation was to determine the overall effect of the TAACCCT Round 4 grant on students who were involved in grant-affected activities. This goal was achieved by collecting and analyzing data for the grant-affected programs at the college. In addition, the grant-affected program participants were compared to a similar comparison group housed at Northern Virginia Community College, which ran in parallel to the grant-affected program during the grant period. Comparability of the comparison program to the grant-affected program was based on similarities in program structure and student demographics. The data included in this report was collected based on research questions referenced in the methodologies portion of this report. The research questions were based on previously established Department of Labor outcomes.

Impact Analysis Limitations

It is important to understand the caveats and limitations for the evaluation, such as evaluation design, sample size concerns, and data gap possibilities. Below is a list of caveats that should be acknowledged:

- A random-assignment research design was impractical because the grant-affected programs had limited resources to serve a limited number of students. Randomly assigning those students to different systems of programs and services is resource-intensive and would hinder the success of the program. Therefore, a quasi-experimental evaluation was chosen for this evaluation.
- Small sample sizes may result for some programs, especially when evaluating more restrictive grant outcomes, such as post-completion grant outcomes #7 and #8, which only relate to non-incumbent program completers.
- Gaps in the data due to missing elements from college databases, incomplete Participant Intake Forms, or mismatched data between data templates are probable throughout the evaluation. Efforts have been made to fill the gaps through using more than one data source for information, where possible.
- The evaluation was envisioned to include a comparison analysis based on individual level data. The best comparison data available was from a nearby community college (Northern Virginia Community College), which, unfortunately, was unable to furnish individual level data. Therefore, the comparisons made below between participant groups and comparison groups are based on aggregate data. This allows for only a cursory look at which group had a higher completion rate (for example). A deeper analysis would adjust for differences between the groups based on a propensity score methodology. Without such an adjustment, the comparisons must be interpreted cautiously – correlation rather than causation.

Impact Evaluation Data Collection Procedure

The majority of data was captured through existing systems. First, the VSU student information system included specific student enrollment, course, and program data that were organized and submitted to the evaluation team throughout the year in the form of On-Going data forms. Second, individual-level data on quarterly wages and employment was available through unemployment insurance (UI) records through the state's employment data system, the Virginia Employment Commission (VEC).

To supplement data from existing sources, primary data collection occurred. Participant Intake Forms (PIFs) were administered to each participant, which captured key baseline data elements that may not have been found in the college's student information system, including certain demographics. In

addition, post-completion surveys were distributed to each participant who completed a grant-affected program. Specific data elements that were not expected to be available from other sources were gathered from the survey, including: occupation of employment, intensity of employment, hourly wage, and presence of benefits. The survey also allowed for additional visibility/confirmation of data elements gathered from institutional sources. Data was collected from each source as it became available on a rolling basis. VSU collected data on grant participants throughout the school year as cohorts progressed through their grant-affected programs. UI data was collected once at the end of the grant and encompassed the quarters that were available from the state agency at that time. Data on comparison persons was collected at an aggregate level at the end of the grant from Northern Virginia Community College (NOVA). Additional details about NOVA data acquisition can be found in the Comparison Analysis section of this report.

Outcomes Summary

At the start of the grant, the DOL required VSU to establish grant goals, which are referenced each year for Annual Performance Reporting. The figure below is a comparison on the grant goals to actual grant numbers achieved by VSU.

Figure 1: VSU Grant Numbers vs. Grant Goals
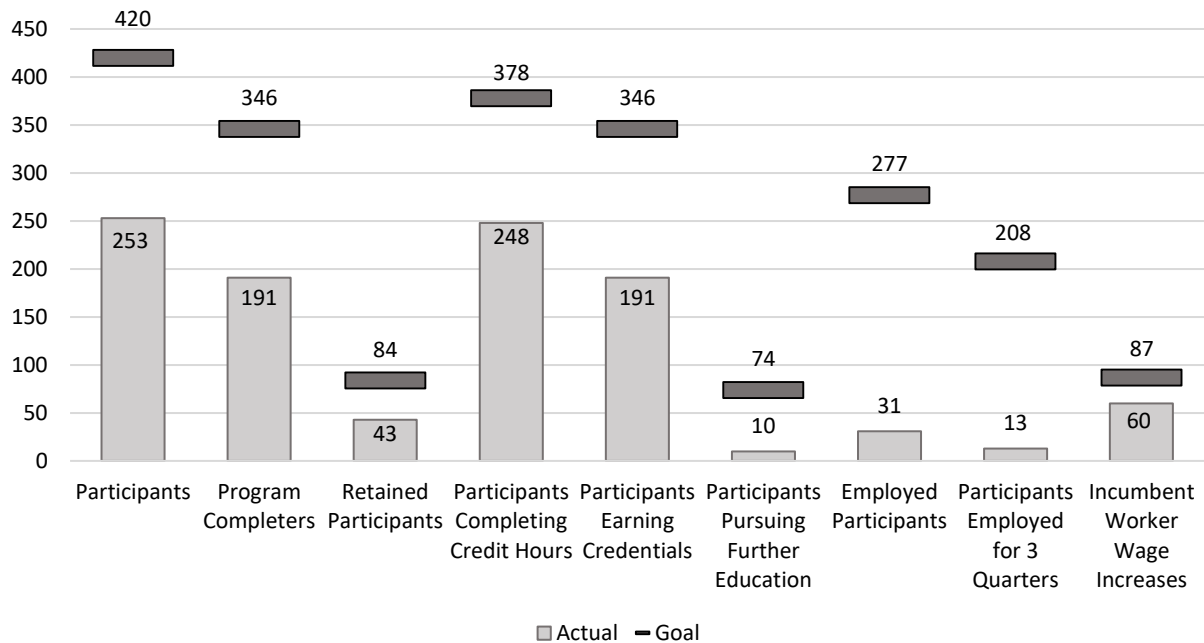
Impact Evaluation Data Analysis

The following portion of the final report describes the data used for the impact evaluation at VSU. A summary of all participants at VSU will be shown, followed by separate breakdowns of each of the four program groups. Data will be presented in a descriptive statistics table for each program group. Descriptions of each outcome can be found in the Impact Evaluation Research Questions portion of this report.

Virginia State University Outcomes Summary

Virginia State University identified four grant-affected program groups to be evaluated: Wireless Technician, Project Management, Logistics and Supply Chain, and Enterprise Resource Planning. Each

program group had a unique comparison group. These four program groups are presented with separate tables for each program group.

The table below details the demographics and grant outcomes for all grant-affected program groups for Virginia State University. The data within the table includes aggregate information from the Spring of 2016 through the end of the grant.

Table 2: Summary Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	253	253	285	285
Demographics				
Age	24.7 ± 7.5	249	41.3	285
Female	37 (19%)	199	148 (52%)	285
White	15 (6%)	252	101 (51%)	197
Black	232 (92%)	252	47 (24%)	197
Other/More than One Race	5 (2%)	252	49 (25%)	197
Hispanic/Latino	4 (2%)	253	22 (8%)	285
Full-Time	NA	NA	0 (0%)	285
Part-Time	NA	NA	285 (100%)	285
Incumbent Worker	98 (39%)	252	NA	NA
Eligible Veteran	27 (11%)	253	NA	NA
Disabled	6 (2%)	253	NA	NA
Pell Eligible	60 (24%)	252	NA	NA
TAA Eligible	4 (2%)	253	NA	NA
Outcomes				
Program Completers	191 (75%)	253	74 (26%)	285
Credentials Earned	222	253	74	285
Students Earning Certificates (<=1 year)	191 (75%)	253	74 (26%)	285
Students Earning Certificates (>1 year)	0 (0%)	253	0 (0%)	285
Students Earning Degrees	0 (0%)	253	0 (0%)	285
Credit Hours Completed	2289	253	1019	285
Employed After Program of Study Completion	31 (26%)	121	NA	NA
Retained in Employment 3 Quarters After Completion	13 (42%)	31	NA	NA
Incumbent Worker Completer	70 (71%)	98	NA	NA
Wage Increase Post-Enrollment	60 (61%)	98	NA	NA
Further Education after Program of Study Completion	10 (8%)	121	NA	NA
Retained in Other Education Program	0 (0%)	62	NA	NA

Of the 253 total participants, 191 (75%) completed a grant-affected program of study, all at the short-term level. To compare, only 26% of comparison persons completed a program. A total of 2,289 credit hours were completed by participants, averaging out to 9 credit hours earned per participant, higher than the average number of earned credit hours for comparison persons (4 credit hours).

26% of non-incumbent participants found employment in the quarter after program completion. Of those 31 participants, 13 (26%) were retained in employment for at least three quarters after program completion. Of the 98 incumbent worker participants (39% of total participants), 70 (71%) received an increase in wages. 9 of the 11 survey respondents (82%) believed that the program that was completed at VSU would lead to career advancement in the future, and that they would recommend the program to someone else considering a career in the same field of study.

The racial composition of the participants is majority minority, with 232 (92%) of participants identifying as Black or African American. 19% of participants identified as female, and 24% of participants were pell-eligible.

Data Analysis by Program Group

VSU had four participant groups, all at the short-term length (less than or equal to one year). Each participant group was aligned with a unique comparison group at Northern Virginia Community College that was as similar as possible to the participant group. The table below identifies each participant group and its corresponding comparison group. It should be noted that some participants were enrolled in multiple participant groups.

Table 3: Participant and Comparison Groups

Participant Group	Comparison Group
Wireless Technician	Combination of: - Database Administrator - Cisco Networking/CCNA Preparation
Project Management	Project Management
Enterprise Resource Planning	Database Administrator
Logistics and Supply Chain	Cisco Networking/CCNA Preparation

Virginia State Participant Group Breakdown

The table below details the demographics and grant outcomes for the Wireless Technician participant group and Database Administrator/Cisco Networking/CCNA Preparation comparison group. The data within the table includes aggregate information from Spring 2016 (Cohort 1) through the end of the grant.

Table 4: Wireless Technician vs. Database Administrator/Cisco Networking/CCNA Preparation Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	81	81	85	85
Demographics				
Age	23.9 ± 6.9	77	37.6	85
Female	5 (8%)	65	33 (39%)	85
White	5 (6%)	81	29 (43%)	67
Black	73 (90%)	81	16 (24%)	67
Other/More than One Race	3 (4%)	81	22 (33%)	67
Hispanic/Latino	0 (0%)	81	6 (7%)	85
Full-Time	NA	NA	0 (0%)	85
Part-Time	NA	NA	85 (100%)	85
Incumbent Worker	27 (33%)	81	NA	NA
Eligible Veteran	14 (17%)	81	NA	NA
Disabled	3 (4%)	81	NA	NA
Pell Eligible	26 (32%)	81	NA	NA
TAA Eligible	2 (2%)	81	NA	NA
Outcomes				
Program Completers	76 (94%)	81	20 (24%)	85
Credentials Earned	76	81	20 (24%)	85
Students Earning Certificates (<=1 year)	76 (94%)	81	20 (24%)	85
Students Earning Certificates (>1 year)	0 (0%)	81	0 (0%)	85
Students Earning Degrees	0 (0%)	81	0 (0%)	85
Credit Hours Completed	1296	81	348.6	85

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Employed After Program of Study Completion	12 (23%)	52	NA	NA
Retained in Employment 3 Quarters After Completion	6 (50%)	12	NA	NA
Incumbent Worker Completer	24 (89%)	27	NA	NA
Wage Increase Post-Enrollment	14 (52%)	27	NA	NA
Further Education after Program of Study Completion	5 (10%)	52	NA	NA
Retained in Other Education Program	0 (0%)	5	NA	NA

Of the 81 participants, 76 (94%) completed a grant-affected program of study. Only 20 of the 85 comparison persons (24%) completed a comparison program of study. The average number of earned credit hours per participant is 16, much higher than the average earned credit hours for a comparison person (4).

The average age for Wireless Technician participants was 24, indicating that the majority of students enrolled only a few years after completing high school. The average age for comparison persons was much higher, at 38. There was a greater share of Black/African American participants (90%) than comparison persons (24%), though the comparison group also had 33% of people identifying as Other/More than One Race. Female enrollment in the participant group was lower than the comparison group (8% and 39%, respectively).

23% of non-incumbent participants found employment in the quarter after program completion (12 participants). Of those, 50% (6) retained employment three quarters after program completion. Of the 27 incumbent worker participants (33% of total participants), 14 (52%) received a wage increase post-enrollment.

The table below details the demographics and grant outcomes for the Project Management participant and comparison group. The data within the table includes aggregate information from Fall 2016 through the end of the grant.

Table 5: Project Management vs. Project Management Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	30	30	117	117
Demographics				
Age	29.7 ± 8.8	30	42.0	117
Female	9 (30%)	30	61 (52%)	117
White	0 (0%)	29	42 (58%)	72
Black	29 (100%)	29	19 (26%)	72
Other/More than One Race	0 (0%)	29	11 (15%)	72
Hispanic/Latino	0 (0%)	30	11 (9%)	117
Full-Time	NA	NA	0 (0%)	117
Part-Time	NA	NA	117 (100%)	117
Incumbent Worker	17 (57%)	30	NA	NA
Eligible Veteran	3 (10%)	30	NA	NA
Disabled	0 (0%)	30	NA	NA
Pell Eligible	7 (23%)	30	NA	NA
TAA Eligible	2 (7%)	30	NA	NA
Outcomes				
Program Completers	17 (57%)	30	42 (36%)	117
Credentials Earned	17	30	42 (36%)	117

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Students Earning Certificates (<=1 year)	17 (57%)	30	42 (36%)	117
Students Earning Certificates (>1 year)	0 (0%)	30	0 (0%)	117
Students Earning Degrees	0 (0%)	30	0 (0%)	117
Credit Hours Completed	252	30	427.7	117
Employed After Program of Study Completion	6 (60%)	10	NA	NA
Retained in Employment 3 Quarters After Completion	2 (33%)	6	NA	NA
Incumbent Worker Completer	7 (41%)	17	NA	NA
Wage Increase Post-Enrollment	11 (65%)	17	NA	NA
Further Education after Program of Study Completion	1 (10%)	10	NA	NA
Retained in Other Education Program	0 (0%)	13	NA	NA

17 of the 30 participants (57%) enrolled in Project Management earned a short-term certificate. The comparison group had more students (117) and more total completions (42), however the percentage of completers was lower, at 36%. Participants earned, on average, 8 credit hours per person. Comparison persons averaged half the amount, at only 4 credit hours earned per person.

The average age of participants was 30, the oldest of the four program groups. Project Management also had the highest share of female enrollment, at 30%. All participants identified as Black/African American, compared to only 26% of the comparison group.

60% of non-incumbent participants found employment in the quarter after program completion. Of those, 33% retained employment for three quarters following program completion. Of the 17 incumbent worker participants, (57% of total participants), 11 received a wage increase post-enrollment.

The table below details the demographics and grant outcomes for the Enterprise Resource Planning participant group and Database Administrator comparison group. The data within the table includes aggregate information from Spring 2016 through the end of the grant.

Table 6: Enterprise Resource Planning vs. Database Administrator Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	124	124	74	74
Demographics				
Age	24.8 ± 7.8	120	38.0	74
Female	17 (20%)	85	33 (45%)	74
White	8 (7%)	120	26 (45%)	58
Black	111 (92%)	120	13 (22%)	58
Other/More than One Race	1 (1%)	120	19 (33%)	58
Hispanic/Latino	3 (2%)	120	6 (8%)	74
Full-Time	NA	NA	0 (0%)	74
Part-Time	NA	NA	74 (100%)	74
Incumbent Worker	49 (41%)	119	NA	NA
Eligible Veteran	9 (8%)	120	NA	NA
Disabled	2 (2%)	120	NA	NA
Pell Eligible	23 (19%)	119	NA	NA
TAA Eligible	0 (0%)	120	NA	NA
Outcomes				
Program Completers	99 (80%)	124	12 (16%)	74
Credentials Earned	100	124	12 (16%)	74
Students Earning Certificates (<=1 year)	99 (80%)	124	12 (16%)	74

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Students Earning Certificates (>1 year)	0 (0%)	124	0 (0%)	74
Students Earning Degrees	0 (0%)	124	0 (0%)	74
Credit Hours Completed	492	120	314.4	74
Employed After Program of Study Completion	12 (20%)	60	NA	NA
Retained in Employment 3 Quarters After Completion	6 (50%)	12	NA	NA
Incumbent Worker Completer	39 (80%)	49	NA	NA
Wage Increase Post-Enrollment	35 (71%)	49	NA	NA
Further Education after Program of Study Completion	7 (12%)	60	NA	NA
Retained in Other Education Program	0 (0%)	25	NA	NA

Of the 124 participants, 99 (80%) completed a grant-affected program of study. Only 16% of the comparison group (12 people) completed a comparison program of study. Both the participant and comparison groups averaged about the same number of credit hours earned per person, at 4.

The average age for participants was 25, younger than the comparison group average age of 38. There were less females enrolled in the participants group (20%) than the comparison group (45%). The majority of participants identified as Black/African American.

20% of non-incumbent participants found employment in the quarter after program completion. Of those 12 participants, 50% were retained in employment in the three quarters after completion. 71% of the 49 incumbent workers had a wage increase post-enrollment.

The table below details the demographics and grant outcomes for the Logistics & Supply Chain participant group and Cisco Networking/CCNA Preparation comparison group. The data within the table includes aggregate information from Summer 2017 through the end of the grant.

Table 7: Logistics & Supply Chain vs. Cisco Networking/CCNA Preparation Outcomes Table

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Total Number of Individuals	59	59	11	11
Demographics				
Age	22.5 ± 5.9	58	35	11
Female	8 (16%)	49	0 (0%)	11
White	6 (10%)	58	3 (33%)	9
Black	51 (88%)	58	3 (33%)	9
Other/More than One Race	1 (2%)	58	3 (33%)	9
Hispanic/Latino	2 (3%)	58	0 (0%)	11
Full-Time	NA	NA	0 (0%)	11
Part-Time	NA	NA	11 (100%)	11
Incumbent Worker	25 (43%)	58	NA	NA
Eligible Veteran	3 (5%)	58	NA	NA
Disabled	2 (3%)	58	NA	NA
Pell Eligible	14 (24%)	58	NA	NA
TAA Eligible	0 (0%)	58	NA	NA
Outcomes				
Program Completers	28 (47%)	59	8 (73%)	11
Credentials Earned	29	59	8 (73%)	11
Students Earning Certificates (<=1 year)	28 (47%)	59	8 (73%)	11
Students Earning Certificates (>1 year)	0 (0%)	59	0 (0%)	11
Students Earning Degrees	0 (0%)	59	0 (0%)	11

Variable	Participant Group	Participant Group N	Comparison Group	Comparison Group N
Credit Hours Completed	249	58	34.2	11
Employed After Program of Study Completion	6 (50%)	12	NA	NA
Retained in Employment 3 Quarters After Completion	0 (0%)	6	NA	NA
Incumbent Worker Completer	15 (60%)	25	NA	NA
Wage Increase Post-Enrollment	16 (64%)	25	NA	NA
Further Education after Program of Study Completion	3 (25%)	12	NA	NA
Retained in Other Education Program	0 (0%)	32	NA	NA

Of the 59 participants, 27 (46%) completed a grant-affected program of study. Participants earned, on average, slightly more credit hours than the comparison group (4 credit hours and 3 credit hours, respectively).

The average age for Logistics & Supply Chain participants is the youngest of all four participant groups, at 23. 88% of participants identify as Black/African American, while the racial composition of the comparison group is equally split between White, Black, and Other/More than One Race. 16% of participants identify as female.

50% of non-incumbent participants found employment in the quarter after program completion. Of the 25 incumbent worker participants (43% of total participants), 64% (16 students) received a wage increase post-enrollment.

Conclusion

The AWE4CCR project and the training programs it offered did begin to address the workforce system gaps the project was intended to address. A new Wireless Technician program was established, and Bachelor of Science degrees in Project Management, Logistics and Supply Chain, and Enterprise Resource Planning were training options for participants. All of these training programs are providing trained workers for the wireless infrastructure industry, and enabled VSU to be a better provider of trained workers for the industry. As envisioned, veterans and soldiers participated in and completed these programs, although not at rates as high as expected (only 11%). AWE4CCR partners charged with recruiting veterans and other target participants (e.g., dislocated workers) were not effective and those partnerships were discontinued, which resulted in on-going challenges with recruiting targeted participants. VSU eventually sought and USDOL approved a grant modification to recruit among students enrolling in VSU, and that improved recruitment and enrollment, although his change did not take effect until about year 3 of the project. AWE4CCR encountered significant early challenges in changing the grant entity to whom the grant was awarded, and other early challenges with the curriculum design of the Wireless Technician curriculum that led to further implementation delays and inhibited participant recruitment throughout the project. In the end, AWE4CCR enrolled 253 participants, and had 191 completers who earned a total of 222 credentials. This total enrollment is less than expected based on the original grant proposal (over 400), but not by as much as could be expected based on the implementation challenges described above. Enrolled participants fell short on all other key outcomes, not surprisingly, including employment outcomes. Employment outcomes were affected because of the change in industry skill needs that kept the Wireless Technician training less in demand by employers despite curricular modifications to address this, and the subsequent shift to participant enrollment in more-needed, longer-term degree programs which have not yet been completed by a significant number of participants. Described implementation delays and a shift in participant enrollment in longer-term degree programs also meant that many participants enrolled in these longer-

term degree programs in the third year of the grant, compounding the number of participants not yet completing. Many participants were also incumbent workers employed upon enrollment and thus could not be included in post-completion employment outcomes. Of the completers who were eligible to be counted in the post-completion employment outcomes, 40% were employed and another 13% were continuing their education. In the end the unusual participant recruitment challenges, and rapidly changing industry workforce skill needs that continued to hampered demand for the Wireless Technician program (the primary program for which project outcomes were originally projected), had a very significant impact on enrollment and all subsequent project outcomes. On a more positive note the comparison program outcomes data indicates AWE4CCR participants had better outcomes for many specific outcome measures than the comparison program participants.