



# Trade Adjustment Assistance Community College and Career Training Grant Program

## Round 4 Early Outcomes Study Report



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## About This Report

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## CONTENTS

<b>Executive Summary .....</b>	<b>vi</b>
<b>1. Introduction .....</b>	<b>1</b>
1.1. Overview of the TAACCCT Grant Program and National Evaluation .....	1
1.2. Outcomes Study Overview .....	2
1.3. Guide to the Report.....	5
<b>2. Study Design and Data Sources .....</b>	<b>6</b>
2.1. Capacity-Building Theory of Change .....	6
2.2. Design for Implementation Analysis .....	8
2.3. Design for Outcomes Analysis .....	9
2.4. Data Sources .....	11
2.5. Analysis Methods .....	11
2.6. Study Limitations .....	13
<b>3. Implementation Findings .....</b>	<b>14</b>
3.1. Overview of Programs .....	14
3.2. Accelerated and Enhanced Learning Strategies .....	19
3.3. Persistence and Completion Strategies .....	23
3.4. Connections to Employment Strategies.....	26
<b>4. Characteristics of Participants at Program Entry, Training Duration and Service Receipt, and Participant Outcomes a Year Later.....</b>	<b>30</b>
4.1. Characteristics of Participants at Program Entry .....	31
4.2. Training Duration .....	36
4.3. Service Receipt .....	37
4.4. Outcomes Related to Training Progress .....	43
4.5. Outcomes Related to Employment, Earnings, Income, and Receipt of Public Assistance .....	44
<b>5. Participant Outcomes, by Characteristics at Program Entry.....</b>	<b>54</b>
5.1. Program Completion.....	56
5.2. Employment and Earnings Outcomes .....	59
5.2.1 Training-Related Employment .....	60
5.2.2 Change in Earnings .....	62
5.3. Receipt of Public Assistance Benefits .....	65
<b>6. Participant Outcomes, by Service Receipt .....</b>	<b>68</b>
6.1. Program Completion, by Service Receipt.....	71
6.2. Training-Related Employment, by Service Receipt .....	77
6.3. Change in Earnings, by Service Receipt .....	81
6.4. Public Assistance Benefit Receipt, by Service Receipt.....	84
<b>7. Projected Participant Outcomes for Future Cohorts, by Program .....</b>	<b>88</b>
7.1. Program Completion.....	90
7.2. Training-Related Employment .....	92
7.3. Change in Earnings .....	95
7.4. Public Assistance Benefit Receipt.....	96
7.5. Summary of Rankings across the Four Outcomes.....	98

**8. Summary and Discussion ..... 101**  
8.1. How Findings Align with Short-term Outcomes in the Theory of Change ..... 101  
8.2. What Do the Findings Suggest for Future Programs? ..... 103  
**References ..... 106**

**LIST OF BOXES**

Grantees and Colleges by Grant Round ..... 1

TAACCCT National Evaluation Components..... 2

Overview of Programs in the Outcomes Study ..... 4

Enrolling Study Participants..... 10

Key Takeaways: Implementation Findings ..... 14

Accelerated and Enhanced Learning Strategies Defined ..... 20

Persistence and Completion Strategies Defined..... 23

Examples of Staff Providing Academic and Nonacademic Supports ..... 25

Connections to Employment Strategies ..... 27

Key Takeaways: Characteristics of Participants at Program Entry..... 31

Key Takeaways: Outcomes a Year after Program Entry ..... 31

Key Takeaways: Participant Outcomes by Characteristics at Program Entry ..... 54

Interpreting Exhibits in Chapters 5 and 6 ..... 55

Survey Questions: Program Completion ..... 56

Study Population..... 59

Survey Questions: Training-Related Employment ..... 60

Public Assistance Programs included in this Study ..... 65

Key Takeaways: Service Receipt and Participant Outcomes..... 68

Warning ..... 68

Analytic Methods and Interpreting Adjusted Differences ..... 69

Measurement of Service Receipt..... 70

Key Takeaways: Participant Outcomes at Individual Programs on..... 88

Warning ..... 88

Interpreting Exhibits in Chapter 7 ..... 89

**LIST OF EXHIBITS**

Exhibit ES-1. Round 4 Grantees in the Outcomes Study ..... vii

Exhibit ES-2. Participant Characteristics at Program Entry ..... x

Exhibit ES-3. Training Progress Outcomes .....xi

Exhibit ES-4. Employment Outcomes ..... xii

Exhibit ES-5. Change in Quarterly Earnings ..... xii

Exhibit ES-6. Receipt of Public Assistance Benefits at Program Enrollment and 15 Months Later ..... xiii

Exhibit ES-7. Participant Outcomes by Participant Characteristics and Services Received ..... xiv

Exhibit 1-1. Round 4 Grantees in the Outcomes Study..... 3

Exhibit 2-1. Theory of Change..... 7

Exhibit 3-1. Program Length, Credentials, and Strategies Used, by Industry ..... 15

Exhibit 4-1. Participants’ Family Structure at Program Entry ..... 32

Exhibit 4-2. Age at Program Entry ..... 32

Exhibit 4-3. Race and Ethnicity..... 32

Exhibit 4-4. Educational Attainment at Program Entry ..... 33

Exhibit 4-5. Employment Status at Program Entry ..... 33

Exhibit 4-6. Prior Industry of Participants by Employment Status at Program Entry ..... 34

Exhibit 4-7. “Most Important” Motive for Enrollment..... 35

Exhibit 4-8. Public Assistance Benefit Receipt at Program Entry..... 36

Exhibit 4-9. Training Duration ..... 37

Exhibit 4-10. Topics Covered in Classes that Taught Skills Other than Occupational Skills ..... 38

Exhibit 4-11. Sources of Financial Assistance for Training Programs..... 39

Exhibit 4-12. Participation in Various Types of Work-based Learning Experience ..... 40

Exhibit 4-13. Receipt of Various Types of Job Search and Placement Assistance Services ..... 41

Exhibit 4-14. Organization Providing Services ..... 42

Exhibit 4-15. Training Outcomes at 15 months ..... 43

Exhibit 4-16. Average Employment by Quarter from Three Quarters Prior to the Quarter of  
Program Entry to Eight Quarters Later..... 45

Exhibit 4-17. Average Quarterly Earnings from Three Quarters Prior to the Quarter of Program  
Entry to Eight Quarters Later..... 46

Exhibit 4-18. Average Quarterly Earnings, by Employment Status..... 47

Exhibit 4-19. Change in Quarterly Earnings by Enrollment Status..... 48

Exhibit 4-20. Employment Status and Training-related Employment, by Enrollment Status..... 49

Exhibit 4-21. Employment Status at Survey Follow-up, by Enrollment Status ..... 50

Exhibit 4-22. Employed in Job with Benefits, by Enrollment Status ..... 51

Exhibit 4-23. Household Poverty Status and Receipt of Public Assistance Benefits over Study Period ..... 52

Exhibit 4-24. Household Poverty Status and Receipt of Public Assistance Benefits at Follow-up, by Enrollment Status..... 53

Exhibit 5-1. Program Completion, by Participant Characteristics at Program Entry ..... 58

Exhibit 5-2. Training-related Employment, by Participant Characteristics at Program Entry ..... 61

Exhibit 5-3. Two-Year Change in Quarterly Earnings, by Participant Characteristics at Program Entry..... 63

Exhibit 5-4. Public Assistance Benefit Receipt 15 Months after Program Entry, by Participant Characteristics at Program Entry, Including Receipt of Public Assistance from Selected Federal Programs ..... 66

Exhibit 6-1. Adjusted Differences in Program Completion by Service Receipt ..... 72

Exhibit 6-2. Receipt of Individual Services, by Participant Cluster..... 75

Exhibit 6-3. Receipt of Categories of Services, by Participant Cluster..... 76

Exhibit 6-4. Connections of Different Service Bundles with Program Completion ..... 77

Exhibit 6-5. Adjusted Differences in Training-Related Employment by Service Receipt ..... 79

Exhibit 6-6. Connections of Different Service Bundles with Training-Related Employment ..... 80

Exhibit 6-7. Connections of Service Receipt with Change in Earnings ..... 82

Exhibit 6-8. Connections of Different Service Bundles with Change in Earnings ..... 83

Exhibit 6-9. Adjusted Differences in Receipt of Public Assistance Benefits by Service Receipt ..... 85

Exhibit 6-10. Connections of Different Service Bundles with Receipt of Public Assistance Benefits..... 87

Exhibit 7-1. Projected Program Completion Rates for Future Cohorts, by Program ..... 91

Exhibit 7-2. Projected Training-related Employment Rates for Future Cohorts, by Program..... 93

Exhibit 7-3. Projected Two-Year Changes in Earnings for Future Cohorts, by Program..... 95

Exhibit 7-4. Projected Public Assistance Benefits Receipt for Future Cohorts, by Program ..... 97

Exhibit 7-5. Summary of Program Rankings, by Outcome ..... 99

# Executive Summary

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The Trade Adjustment Assistance Community College and Career Training (TAACCCT) program provided grants to community colleges and other eligible institutions of higher education to expand and improve their ability to deliver education and career training programs. Grant-funded colleges served workers who were eligible for training under the Trade Adjustment Assistance for Workers (TAA) program as well as other adults in need of training for in-demand occupations.<sup>1</sup> In doing so, the grant program supported the U.S. Department of Labor's (DOL) goal of training workers with the skills to succeed in fast-growing, high-wage occupations. Between 2011 and 2014, the grant program awarded \$1.9 billion across four rounds of grants to more than 1,000 colleges nationwide.<sup>2</sup> The fourth and final round of grants (71 grantees, 263 colleges) ended in 2018.

In order to build evidence on grant-funded programs and strategies, DOL funded a national evaluation of each grant round to collect and assess qualitative and quantitative data across all participating colleges. The Round 4 evaluation included an outcomes study, the focus of this report.

## THE OUTCOMES STUDY

This report describes the **training, employment, earnings, and self-sufficiency outcomes** of nearly 2,800 participants who enrolled in 34 programs at nine Round 4 grantees. The overarching research questions are:

1. *What were the characteristics of study participants?*
2. *In which features of training programs and services did study participants engage?*
3. *What education outcomes did study participants in short-term training programs achieve?*
4. *Did participants obtain employment? If so, was it in an occupation related to their training? What were their earnings? What were the characteristics of their jobs?*

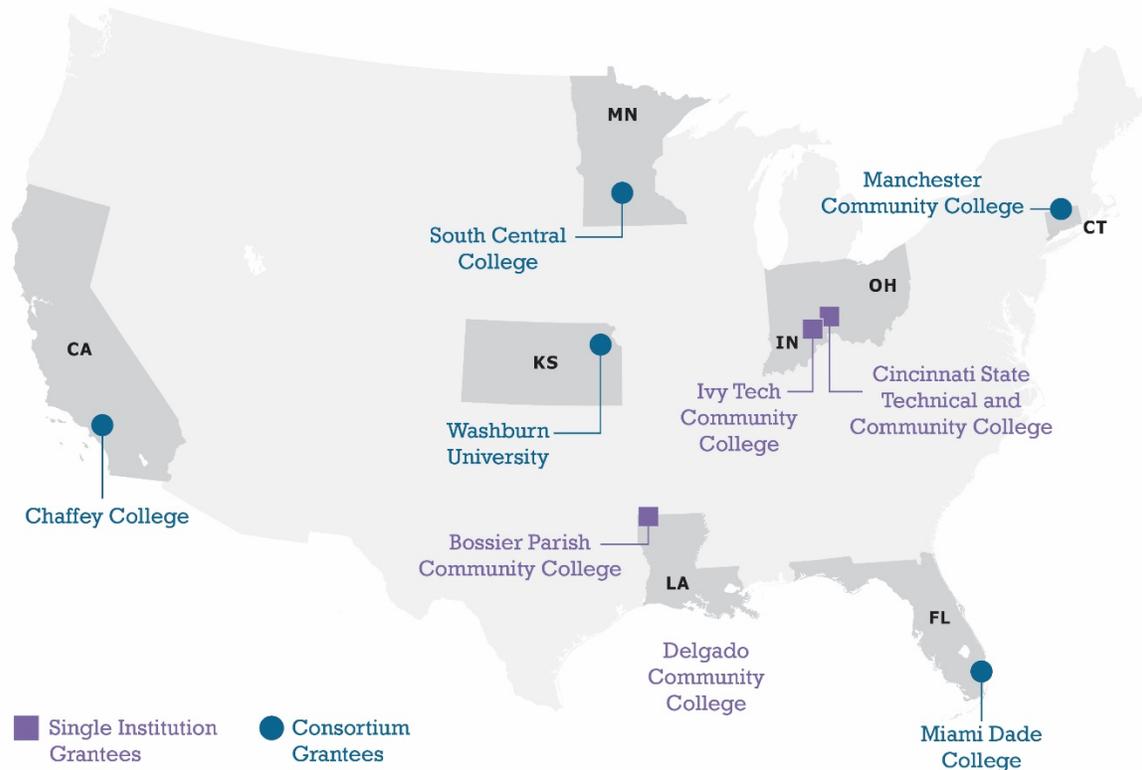
The programs were grant-funded, generally short-term, and culminated in an industry-recognized credential. Each program had a distinct entry point, which facilitated enrollment of study participants. **Exhibit ES-1** shows the location of the selected grantees, which included four single-institution grantees and five consortium grantees with a lead college.

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<sup>1</sup> Congress authorized the TAACCCT grant program as part of the American Recovery and Reinvestment Act of 2009 to increase the capacity of community colleges to meet local and regional labor demand for a skilled workforce. Funding for the TAACCCT program was provided by the Health Care and Education Reconciliation Act of 2010. In their applications, grantees needed to provide data and analysis of both current and projected employment opportunities for each targeted industry and specific occupation. This must include data on current and expected job openings with at least two employers in the community in each targeted industry, and may include commitments from employers who expect to hire program participants.

<sup>2</sup> According to Cohen et al. (2017, 3), "729 unduplicated colleges participated in TAACCCT projects." However, the authors note 729 could underestimate the number of unduplicated colleges because some grantees classified members of their consortium as community college districts rather than individual community colleges. The number of duplicated colleges across rounds is 1,113.

**Exhibit ES-1. Round 4 Grantees in the Outcomes Study**



The grantees and programs were diverse.

- The occupation focus of the programs spanned six industries, the most common of which was manufacturing<sup>3</sup> (total of 14 programs across five grantees), followed by information technology (total of nine programs in one grantee), welding (total of five programs across five grantees), construction (total of three programs in one grantee), health care (total of two programs in one grantee), and transportation and warehousing (one program in one grantee).
- Programs ranged in duration from one week to 24 months. The mean program duration was 8.7 months, with a median of 6.5.
  - *Manufacturing* programs ranged from 1 to 16 months.
  - *Information Technology* programs ranged from 4 to 24 months.
  - *Welding* programs ranged from 4 to 18 months.
  - *Construction* programs ranged from 3 to 6 months;
  - *Health Care* programs ranged from 5 to 8 months;
  - *Transportation/Warehousing* program was 1 week to 1 month.

<sup>3</sup> Manufacturing includes advanced manufacturing. As noted in an earlier footnote, the grantees determined which occupations were in demand using labor market information. They had to demonstrate the demand for certain occupations in their grant applications.

- In addition to operating training programs, grantees implemented a variety of **capacity-building strategies** to accelerate and enhance learning, help participants persist in and complete their programs, and connect participants to employment:



– *Accelerated and enhanced learning strategies* to reduce adult learners' time to complete training programs.



– *Persistence and completion strategies* to support adult learners' enrollment in, progress toward, and completion of training programs.



– *Connections to employment strategies* to connect adult learners to the workforce, such as work-based learning strategies.

The analyses presented in this report use data collected from participants at two points in time: program entry, generally the first day of class; and a follow-up survey conducted, on average, 15 months later. The analyses also use data collected from administrative wage records for a slightly longer period of time (five quarters after the quarter of enrollment). The research team selected the follow-up period for the survey to allow time for participants to complete programs (most of which, as noted above, were short-term) and enter employment, and also to provide sufficient time for analysis and reporting within the five-year evaluation period.

Although the study reports on a wide variety of participant outcomes, to answer the final three research questions (whether some subgroups had better outcomes than other subgroups, whether some services have stronger associations with favorable outcomes, and whether some programs had higher levels of favorable outcomes), the report focuses on a narrower set of participant outcomes. This specific focus was necessary given the large number of subgroups, services, and programs studied. The four focal outcomes for this exploration of outcome variation are:

- ***Program completion*** within about a year of program entry (*completion* defined as finishing required classes and being awarded an associated credential);
- ***Training-related employment*** within about a year of program entry (*training-related* defined as having a job that relates closely to the participant's training program) for those not still enrolled in the program at follow-up;
- ***Change in earnings*** between the third quarter before program entry and the fifth quarter after entry for those still not enrolled in the program at follow-up; and
- ***Receipt of public assistance benefits*** (defined as means-tested benefits such as Supplemental Nutrition Assistance Program (SNAP) or Temporary Assistance for Needy Families (TANF) or benefits from other federally-funded assistance programs such as Trade Readjustment Allowances and Social Security Disability Insurance) about a year after program entry.

For each outcome, the report describes findings for the full study sample for which it is relevant, as well as how it varies by participants' characteristics at program entry, the supportive services they received during the program, and the program attended. Throughout, this report uses the variation across the 34 programs to project likely success ranges for future cohorts of participants in these programs or similar ones funded by grant programs like TAACCCT.

## SUMMARY OF FINDINGS

### Implementation of Capacity-Building Strategies

Grantees implemented a range of strategies in each of the three capacity-building areas.

**Accelerated and enhanced learning strategies** were among the most common strategies implemented. For example, all grantees implemented *career pathways programs* or *stackable credentials*. Most implemented at least one *technology-enabled learning strategy*, such as online or hybrid learning. More than half implemented *prior learning assessments* or *provided credit for prior learning*.



**Persistence and completion strategies** often included *academic supports*, such as one-on-one advising and tutoring. Examples of *nonacademic supports* included advisors who helped participants identify and address challenges to program persistence and completion and provided referrals to needed services.



**Connections to employment strategies** included **work-based learning opportunities and employment-related services**. All grantees provided opportunities for skills practice, either in a physical training facility or in a virtual training center. All used grant funds to purchase equipment, and in many instances, to renovate spaces for training. Fewer grantees offered in-program work experience; those that did, generally provided internships. Most grantees provided job search services either informally (through instructors) or through dedicated grant-funded positions, including career coaches, job placement specialists, and career developers.



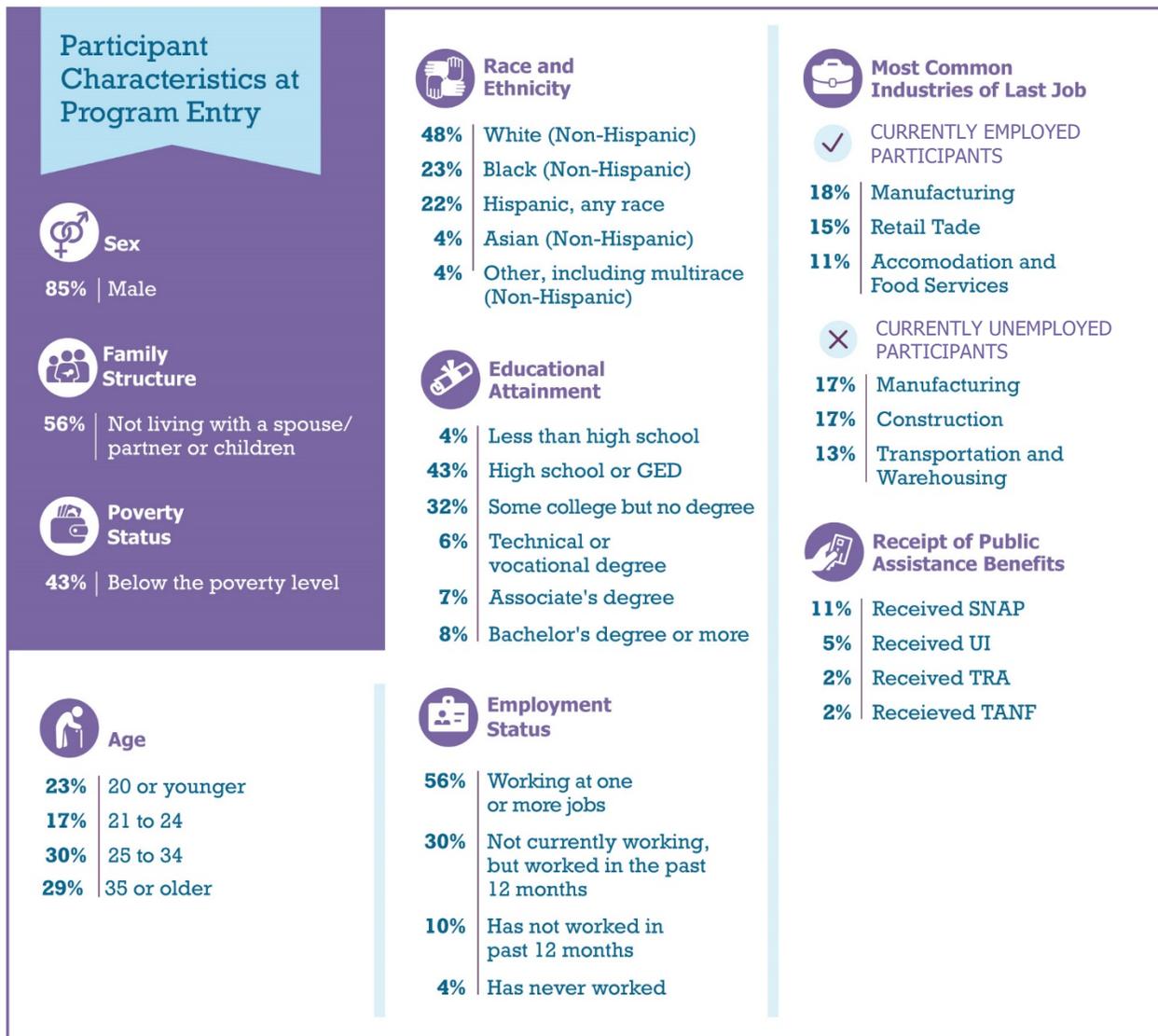
### Characteristics of Participants at Program Entry

Study participants were diverse in terms of demographics, education, employment, household income, and public assistance benefits receipt at program entry, as illustrated in **Exhibit ES-2**.

- The most study participants were male, never married, and diverse in terms of race/ethnicity and age.
- Most participants (53 percent) had at least some postsecondary education at program entry.
- More than half (56 percent) were working at program entry.
- The majority (57 percent) were low income, in families with less than \$30,000 in annual income in the prior year (not shown). More than 40 percent were in poverty.<sup>4</sup> Few, however, received public assistance benefits.

<sup>4</sup> Poverty status is an indicator of whether the household was below the federal poverty level. The research team constructed the measure from exact family income and the number of people in household, using 2017 federal poverty guidelines (<https://aspe.hhs.gov/2017-poverty-guidelines>). For example, the poverty level for a family of three was \$20,420. See Appendix Section A.3 for discussion of imputation of exact family income.

**Exhibit ES-2. Participant Characteristics at Program Entry**

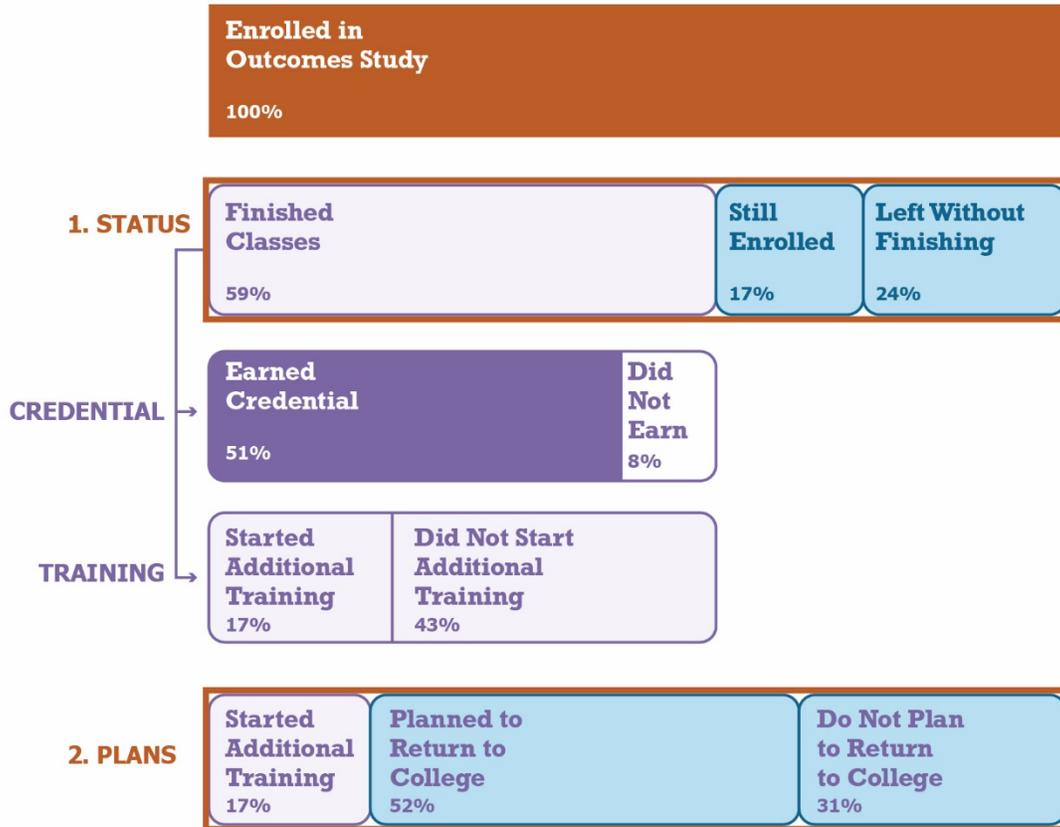


Source: Baseline Information Form  
 Note: Sample includes all study participants ( $N = 2,767$ ).

**Training Outcomes**

**Program completion.** About 15 months after program entry, most participants (59 percent) had finished taking the required courses for their program, but not all of them received an associated credential. About half (51 percent) had completed their program; that is, they finished their courses *and* earned an associated credential (**Exhibit ES-3**). Seventeen (17) percent were still enrolled in their initial program. About one quarter (24 percent) left their program without finishing the required classes. Of those who finished their first program’s classes, 17 percent had enrolled in an additional training within the follow-up period of approximately 15 months.

**Exhibit ES-3. Training Progress Outcomes**



Source: Short-term participant follow-up survey  
 Note: Sample includes all survey respondents (*N* = 2,211).

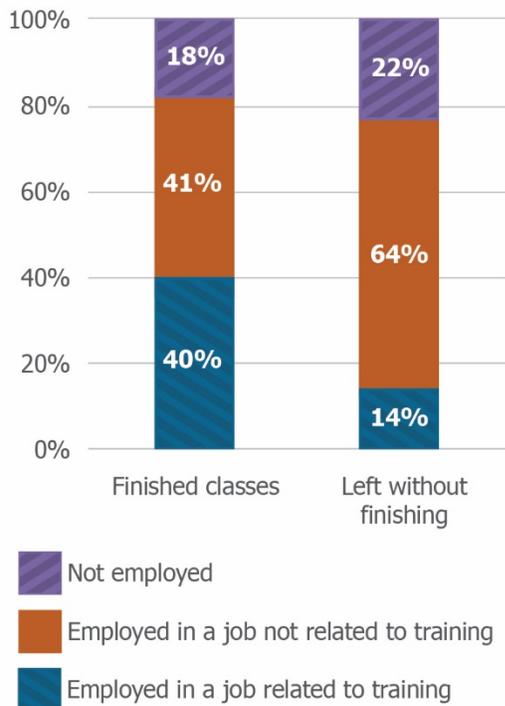
## Employment Outcomes

**Employment Placement, including Training-related employment.** More than three quarters of participants were employed, generally in full-time positions with benefits, approximately 15 months after program entry. Employment rates were similar for those who finished their classes (82 percent) as for those who did not finish (78 percent).

A smaller proportion of participants, however, were employed in a job closely related to their training program (**Exhibit ES-4**). Among those who finished classes, 40 percent had jobs closely related to training, while 41 percent were employed in a job not related to training. For those who did not finish, 14 percent were employed in a job closely related to training, while 64 percent were employed in a job not related to training.

**Change in earnings.** Changes in earnings varied according to whether participants finished their classes. As one would expect, the change in earnings between three quarters before program entry and five quarters after was lowest for those still enrolled ( **Exhibit ES-5** ). Much more surprisingly, the change in earnings during this time period was higher for those who left their program without finishing than for those who finished their classes.

**Exhibit ES-4. Employment Outcomes**



Source: short-term follow-up survey  
 Note: Sample includes survey respondents who finished classes (*N* = 1,316) or left without finishing (*N* = 519). Components may not sum to 100 due to rounding.

**Exhibit ES-5. Change in Quarterly Earnings**

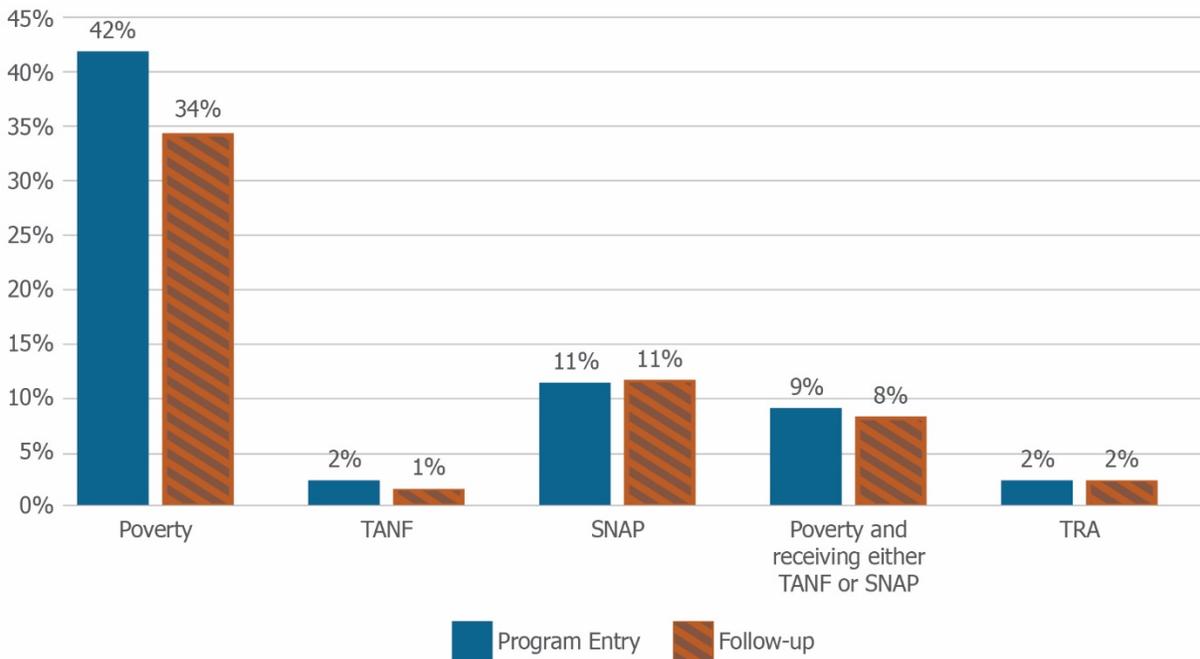


Source: National Directory of New Hires (NDNH)  
 Note: Sample includes participants who responded to the Short-term participant follow-up survey and who provided a valid SSN (*N* = 1,869).

## Public Assistance Outcomes

**Receipt of public assistance benefits.** As [Exhibit ES-6](#) shows, the percentage of participants in poverty decreased by 8 percentage points, from 42 to 34 percent, between program entry and follow-up approximately 15 months later. This decline does not appear to have reduced public assistance benefits receipt, which stayed level over this period.

**Exhibit ES-6. Receipt of Public Assistance Benefits at Program Enrollment and 15 Months Later**



Source: short-term follow-up survey

Note: Sample includes all survey respondents ( $N=2,211$ ).

## Participant Outcomes by Participant Characteristics and Services Received

The research team explored how the four participant outcomes varied according to their characteristics at program entry and the services they received. The 10 characteristics, collected at program entry, were sex, age, race/ethnicity, Veteran status, TRA receipt, TANF and SNAP receipt, prior postsecondary education, time since last job, previous industry, and intended program duration. The 11 services received, collected by the participant short-term follow-up survey, were transfer credit and credit for prior learning (accelerated and enhanced learning strategies); career counseling, academic advising, financial advising, and workplace/life skills (persistence and completion strategies); and employment connections including skills practice in physical or virtual environment and in-program work experience (work-based learning strategies) and job placement services and interviewing practice (employment-related services). The team also explored how outcomes varied across participant groups defined by bundles of services.

Certain participant characteristics and program services were associated with better outcomes, although not consistently across outcomes, as shown in [Exhibit ES-7](#).

**Exhibit ES-7. Participant Outcomes by Participant Characteristics and Services Received**

	Program Completion	Training-related Employment	Change in Earnings	Receipt of Public Assistance Benefits
<b>Participant Characteristics at Program Entry</b>				
Sex				
Race/ethnicity (Black, non-Hispanic)		↓		↑
Veteran Status				↑
TRA receipt			↓	↑
SNAP receipt		↓	↓	↑
TANF receipt				↑
Prior postsecondary education	↑	↑		
Age (25 to 34)	↑		↓	↑
Age (35 and older)	↑		↓	↑
Worked in past year			↓	
Did not work in past year		↓		↑
Previous industry*		↑	↓	
Program is longer than one semester			↑	
<b>Services Received</b>				
Transfer credits		↑	↑	
Credit for prior learning				↑
Career counseling				↑
Academic advising	↓			↑
Financial aid advising		↑		↑
Study, workplace, or life skills course				
Skills practice in work-like physical environments	↑	↑		
Skills practice in virtual environments		↑	↑	
Offered work study job or internship		↑		↑
Job search or placement assistance		↑		
Interviewing practice services		↑		

Source: Baseline Information Form and short-term follow-up survey

Notes: Sample includes all survey respondents (N=2,211). An upward-pointing arrow indicates that the participant characteristic or service is associated with a higher outcome level. A downward-pointing arrow indicates that the participant characteristic or service is associated with a lower outcome level.

\*Previous employment in manufacturing is associated with a higher rate of training-related employment. Prior employment in professional and business services is associated with a smaller increase in earnings.

- **Age** was associated with higher rates of program completion and training-related employment for older participants (age 25 or above), but a stronger growth in earnings for younger participants. Older participants were more likely to receive public assistance benefits approximately 15 months after program entry.
- **Prior postsecondary education** at program entry was associated with higher rates of program completion and training-related employment.
- **Employment status** at program entry was associated with training-related employment, change in earnings, and public assistance benefits receipt. Specifically, participants with recent employment experience and those who previously worked in manufacturing had higher rates of training-related employment. Those who were not employed at program entry but had worked in the past year had weaker growth in earnings. Participants not employed in the year prior to program entry had higher rates of public assistance benefits receipt.
- **Public assistance benefits receipt** at program entry was associated with lower rates of training-related employment, weaker growth in earnings, and higher receipt of public assistance benefits at follow-up.
- **Program duration** was associated with stronger growth in earnings. The longest programs in the outcomes study—information technology programs—were among those associated with the largest earnings increases despite low completion rates. This pattern may be due to the fact that jobs in the information technology sector typically demand higher wages than those in some of the other sectors that were included in the study.
- The combination of **work-based learning and employment-related services** was strongly associated with higher rates of program completion and training-related employment.
- **Skills practices in work-like physical environments** was associated with higher rates of program completion and training-related employment.
- **Transfer credits**, all three **work-based learning services**, and both **employment related services** was associated with higher rates of training-related employment.
- **Transfer credits** had a positive association with earnings growth among participants not still enrolled in the program as of follow-up.
- Different types of **advising** had effects on outcomes. Financial advising was associated with higher training-related employment rates and higher public assistance benefits rates. Academic advising was also associated higher public assistance benefits rates and lower program completion rates.

## Participant Outcomes by Program

Finally, the study explored participant outcomes by each of the 34 programs. Because most programs had small sample sizes, making it difficult to predict outcomes for future cohorts, the research team used new methods of statistical modelling to estimate outcomes and plausible ranges by program.<sup>5</sup>

- ***Few programs ranked highly successful across all four outcomes with high levels of program completion, training-related employment, and change in earnings and a low level of public assistance receipt.*** In general, program rankings varied by the outcome in question. Only one program (welding technology at Washburn University) ranked in the top third across all four outcomes. Four other programs—mechanical craft (Chaffey College), licensed practical nurse (Washburn University), advanced manufacturing and Engineering (Chaffey College), and machining (South Central College)—ranked in the top third on three of the four outcomes.
- ***Seven programs that ranked low in program completion rate and training-related employment were nonetheless in the top third on change in earnings amongst participants who had left their programs.*** All seven of these programs were in the information technology sector. These were amongst the longest programs in the outcomes study, ranging in length between 14 and 24 months.
- ***Four programs that ranked high in program completion rate and training-related employment were in the middle or bottom third on change in earnings.*** These programs were mechanical craft, advanced manufacturing and engineering, and industrial automation at the Chaffey College consortium; and advanced manufacturing and welding technology at the Manchester Community College consortium. The programs ranged in length from 5 to 8 months.

## Discussion

The analyses suggest a few areas for further exploration.

- Almost 60 percent of participants finished their classes, but only 51 percent of all participants (86 percent of finishers) completed their program by earning a credential. The combination of work-based learning and employment-related services had a positive effect on program completion rate. One particular service that program staff expected to help participants persist in and complete their program—academic advising—was associated with lower completion rates. A likely explanation for this result is “reverse causation”; that is, participants already struggling with their coursework may have been more likely to seek out academic advising than participants who were not struggling.
- Only 40 percent of participants who finished their classes or left their program without finishing the required classes were employed in a job closely related to their training at follow-up. As with program completion, the combination of work-based learning and employment-related services had a strong,

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<sup>5</sup> The methods used shift extreme outcome rates based on small sample sizes closer to overall outcome rates. This type of approach is common in the rating of doctors, schools, and teachers, but particularly so in the rating of hospitals. For some of the debate over hospital rating, see for example: <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/Downloads/Overall-Hospital-Quality-Star-Rating-on-Hospital-Compare-Public-Input-Period.pdf>. It is less commonly used for local labor force market outcomes, but the European Union has been working on this and several member countries, such as Portugal and Italy, use these methods in their official local publications. <https://ec.europa.eu/eurostat/documents/3859598/10167610/KS-GO-19-011-EN-N.pdf/3b56be5d-8266-0ee7-7579-7c3e8e63289d>.

positive effect on training-related employment. A potential area for future research is whether certain services in these areas contribute to positive outcomes more than others.

- Change in earnings over a two year period from the 3<sup>rd</sup> quarter before enrollment to the 5<sup>th</sup> quarter after enrollment was higher for participants who left their program before finishing their classes than for those who finished their classes. This somewhat surprising pattern appears to have arisen because those who stopped without finishing had lower pre-training earnings. Both groups had similar earnings at the fifth quarter after enrollment. It is not clear how people who stopped were able to catch up to the finishers despite starting from a lower level of earnings before training. Separately, it was shown that transfer credit receipt and work-based learning were associated with larger increases in earnings. It is possible that previous educational experience combined with new skills practice or in-program employment are enough of a foundation for participants to achieve higher earnings without actually finishing the training. More research would be needed to confirm this speculation.
- Although poverty dropped over the study period, public assistance benefits receipt did not. One possible explanation is that participants were unaware at enrollment of the public assistance benefits to which they were entitled, and that the programs helped them sign up for benefits even as the poverty rate dropped. More research is needed to confirm this theory.

This study explored participant and program outcomes at a point in time. Five quarters of follow-up is not likely sufficient to capture changes in earnings, which may take time to emerge, especially among participants enrolled in longer programs than the follow-up period (e.g., a number of IT programs, a welding program, and a mechatronics program). Relatedly, public assistance benefits receipt will likely decline as earnings grow, thus longer follow-up might provide more positive findings for that outcome. A longer follow-up period might also show higher rates of program completion. Year Up, a well-known training program found earnings impacts as early as Q5 (Fein and Hamadyk 2018), the same endpoint measured in this study, but Project QUEST did not detect an impact until year 4 after randomization,<sup>6</sup> so it would be interesting to follow-up on this sample at least through Q8 and possibly as far as Q16.

At this point in time, services related to positive outcomes included work-based learning, employment-related services, transfer credits, and certain types of advising. Further study could help illuminate what about these services is particularly effective.

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<sup>6</sup> Roder and Elliott (2019). [https://economicmobilitycorp.org/wp-content/uploads/2019/04/NineYearGains\\_web.pdf](https://economicmobilitycorp.org/wp-content/uploads/2019/04/NineYearGains_web.pdf)

# 1. Introduction

The Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program awarded \$1.9 billion to institutions of higher education that offer programs of two years or less, mostly community colleges. The aim was to build their capacity to provide workforce education and training to adults in need of new skills for in-demand jobs, including those eligible for training under the Trade Adjustment Assistance (TAA) program as well as unemployed workers and other adult learners. The grant program, which ran from 2011 to 2018, was also designed to address other key issues—changing education and workforce systems to be better connected and integrated, more effectively addressing employer needs for skilled workers, and transforming how community colleges deliver education and training to adult learners.<sup>7</sup>

The fourth and final round of grants was awarded in 2014 and ended in 2018. This report describes education, earnings, and self-sufficiency outcomes of participants about 15 months after entry into 34 programs at nine selected Round 4 grantees. It also describes the implementation of those grantees' programs. This outcomes study contributes to the body of evidence accumulated from the TAACCCT national evaluation across all four rounds of grantees.

## 1.1. OVERVIEW OF THE TAACCCT GRANT PROGRAM AND NATIONAL EVALUATION

Across all four rounds, TAACCCT funded 256 grantees comprising colleges in all 50 states, the District of Columbia, and Puerto Rico.<sup>8</sup> Grantees could be single institutions or lead institutions of a consortium of colleges.<sup>9</sup>

The TAACCCT grant program aimed to:

- Better prepare TAA-eligible workers and other adults for high-wage, high-skill employment or reemployment in growth industry sectors by increasing their attainment of degrees, certificates, diplomas, and other industry-recognized credentials that match the skills needed by employers;

### Grantees and Colleges by Grant Round

**Round 1:** 49 grantees, 353 colleges

**Round 2:** 79 grantees, 310 colleges

**Round 3:** 57 grantees, 187 colleges

**Round 4:** 71 grantees, 263 colleges

*Approximately 729 unduplicated colleges across all rounds*

<sup>7</sup> Congress authorized the TAACCCT grant program as part of the American Recovery and Reinvestment Act of 2009 to increase the capacity of community colleges to meet local and regional labor demand for a skilled workforce. The Health Care and Education Reconciliation Act of 2010 provided the TAACCCT program with \$1.9 billion in funding over fiscal years 2011–2014, approximately \$500 million annually over four rounds of grants.

<sup>8</sup> Eligible institutions were institutions of higher education, as defined in the Higher Education Act of 1965 as amended (20 USC 1002), that offer programs that can be completed in two years or less. Institutions of higher education include public, proprietary, or nonprofit educational institutions or postsecondary vocational institutions.

<sup>9</sup> Funding varied by the type of grantee. In Round 4, grant awards for single-institution grantees ranged between \$2.32 and \$3.25 million, whereas consortium grantees received between \$6.44 and \$20.0 million. Three single grantees and four consortia were awarded funding at a level that exceeded DOL funding cap guidelines. Such activities could include those that "(1) Advance State Career Pathway Systems; (2) Improve Statewide Data Collection, Integration, and Use; or (3) Create Nationally Recognized Competencies and Credentials" (<https://www.doleta.gov/grants/pdf/SGA-DFA-PY-13-10.pdf>, pp. 20-27).

- Introduce or replicate innovative and effective methods for designing and delivering instruction that addresses specific industry needs and leads to improved learning, completion, and other outcomes for TAA-eligible workers and other adults; and
- Demonstrate improved employment outcomes for grant-supported program participants.

Grantees used three types of capacity-building strategies to connect program participants to employment: strategies that supported **accelerated** learning and **enhanced learning** to reduce adult learners’ time to completing a program of study;<sup>10</sup> **persistence and completion strategies** to support adult learners’ enrollment, progress, and completion of programs; and **employment connection strategies**, including work-based learning and employment services.

In order to build evidence on its grant-funded programs and strategies, DOL funded a national evaluation of each round of grants to collect and assess data across all participating colleges. The Round 4 national evaluation included an outcomes study, the focus of this report.<sup>11</sup>

### TAACCCT National Evaluation Components

- An *implementation analysis* (Rounds 1–4) of the service delivery approaches developed and the systems changed through the grants.
- An *outcomes study* of nine Round 4 grantees and 34 programs using survey data and administrative records to better understand the characteristics of participants, their service receipt, and their training and employment outcomes.
- *Syntheses of third-party evaluation findings* (Rounds 1–4) to develop a national picture of the implementation of the capacity-building strategies and build evidence of the effectiveness of the strategies on participants’ training and employment outcomes.
- A *study of employer relationships* with selected Round 4 employer partners, to better understand employers’ perspectives on how to develop and maintain strong relationships with colleges.

## 1.2. OUTCOMES STUDY OVERVIEW

The outcomes study describes the characteristics of 2,767 participants who enrolled in 34 programs across nine selected grantees. Specifically, it documents participants’ characteristics; service receipt; and outcomes related to training progress, employment, and receipt of public assistance benefits at roughly 15 months after participants’ enrollment into their programs.<sup>12</sup> It also documents earnings growth from the third quarter before enrollment through the fifth calendar quarter following the quarter of enrollment.

<sup>10</sup> For purposes of this report, “completing” a program means finishing the required classes and earning a targeted credential.

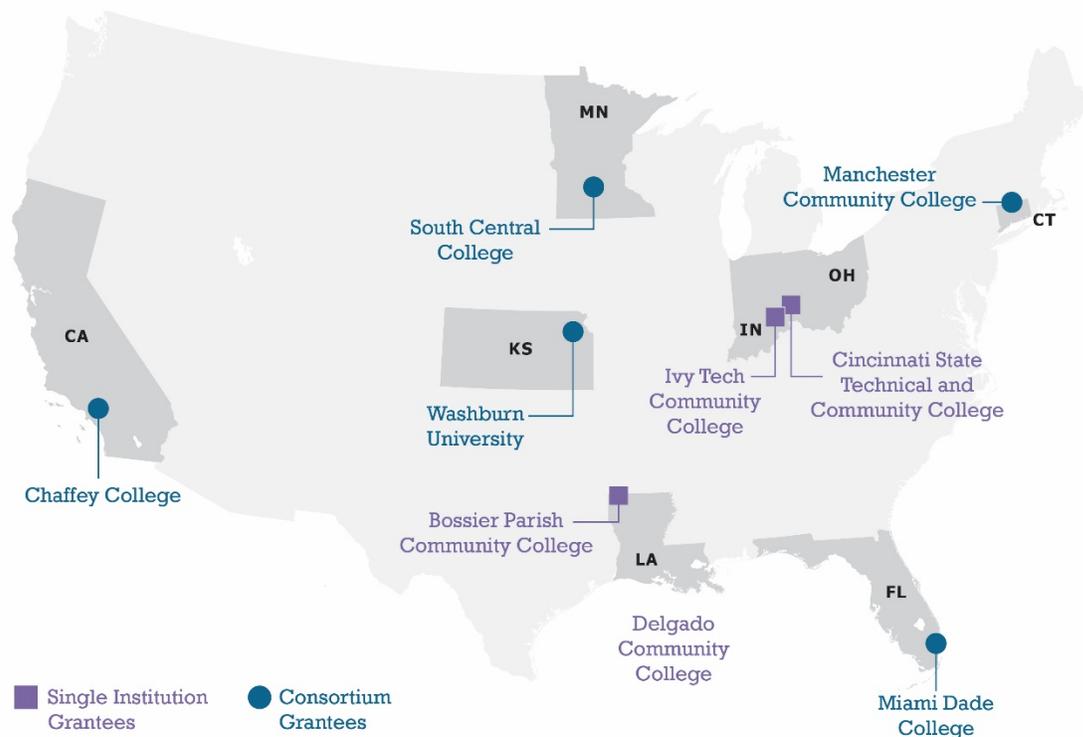
<sup>11</sup> Findings from the implementation study are included in the College Survey Report and this report; the implementation study is not a stand-alone report.

<sup>12</sup> The survey was fielded 12 months after program entry, and many interviews were administered starting at month 12, but interviewing efforts continued for many additional months in order to boost response rates. Median lag from program entry to interview was 14.8 months, with 90 percent of interviews occurring between 12 and 18 months after program entry.

The research team selected the 34 programs for the outcomes study using the following criteria: a program had to (1) be funded or expanded with the grant; (2) be short-term to allow for follow-up starting at 12 months post program entry;<sup>13</sup> (3) result in a credential; and (4) have a distinct point of entry.

Exhibit 1-1 below shows the location of the nine selected grantees.

**Exhibit 1-1. Round 4 Grantees in the Outcomes Study**



The analyses presented in this report use data collected from study participants at two points in time (program entry and approximately 15 months later), as well as administrative wage records (see Chapter 2 for more detail). The report not only summarizes the outcomes of program participants, it provides information of use for policymakers and program operators interested in funding, designing, and implementing college-based programs to train dislocated and other workers.

Analyses in this report:

- Document the capacity-building strategies implemented by grantees;
- Describe the characteristics of adults who enrolled in the grantees’ programs;

<sup>13</sup> While the research team intended to focus on short-term training programs, it had to make some exceptions to increase the grantee and program-level sample sizes. In some cases, such as Ivy Tech’s information technology program, study intake was conducted in introductory level courses that could culminate in a credential, but most often laddered into medium to longer-term training programs. The team weighed the tradeoff between program length and sufficient sample to conduct analyses when selecting programs for inclusion in the study.

- Document the program completion, employment, earnings, and public assistance benefits receipt outcomes of participants a year after program entry;
- Explore how these outcomes vary by participant characteristics at program entry;
- Explore which grant-funded services are more or less helpful to program participants in achieving favorable program completion, employment, earnings, and public assistance benefits receipt outcomes; and
- Explore the variation in participant outcomes by program.

Readers of this report may be interested in extrapolating the information reported here to new settings. To assist readers, this report contains not just results, but measures of how consistent the results are across participants and programs. Consider the example of future earnings. If 80 percent of participants experienced two-year earnings growth between \$200 and \$800 at one program but the comparable range is \$2,300 to \$3,900 at another program, then extrapolation to a new program will involve much more uncertainty than if 80 percent of students at every program experienced earnings growth of \$2,000 to \$2,400.

To address this, the study uses the variability in outcomes across participants and programs to speculate about how well the experiences in these 34 programs would extrapolate to a hypothetical future round of grants. Instead of reporting that some percentage of participants obtained a job aligned with their training, the report provides ranges of how far average experiences from a new round of similar grants might plausibly vary from the average experiences reported here.

### Overview of Programs in the Outcomes Study

- 34 programs offered by 9 grantees and located in 8 states (California, Connecticut, Florida, Indiana, Louisiana, Kansas, Minnesota, and Ohio)
- 6 consortium grantees, 3 single-institution grantees
- Programs spanning 6 industries: manufacturing (14 programs), information technology (9 programs), welding (5 programs), construction (3 programs), health care (2 programs), and transportation/warehousing (1 program)
- 2,767 participants, ranging from 11 to 334 participants per program: average of 55 per program, median of 81
- Program durations ranging from 1 week to 24 months: average of 8.7 months, median of 6.5

## 1.3. GUIDE TO THE REPORT

The remainder of the report includes the following chapters:

- **Chapter 2** describes the outcomes study design and data sources.
- **Chapter 3** documents the nine grantees' capacity-building strategies implemented in the areas of accelerated and enhanced learning, persistence and completion, and connections to employment (work-based learning and employment services). In doing so, it provides useful context for understanding the outcomes of participants in the 34 selected programs.
- **Chapter 4** begins the outcomes analyses. It first describes the characteristics of study participants and then discusses training duration and service receipt. The chapter then reports participants' outcomes related to training progress, employment, earnings, and public assistance benefits receipt approximately 15 months year after program entry.
- **Chapter 5** explores how outcomes vary across subgroups of participants defined by their demographic, economic, and education characteristics at program entry.
- **Chapter 6** explores connections between outcomes and grant-funded services participants received after program entry. The methodology for these analyses focuses on the effect of *use* of a service by participants, rather than the *offer* of a service by the college. Thus, it compares outcomes for participants who reported use of the service versus those who reported not using the service.
- **Chapter 7** summarizes outcomes by program. It ranks the 34 programs relative to one another on program completion, employment, earnings, and public assistance benefits receipt outcomes.
- **Chapter 8** reflects on the findings across chapters.

The report includes the following **appendices**:

- **Appendix A** documents data collection about the characteristics and experiences of program participants when they enrolled in the study and associated statistical analyses. **Appendix B** documents data collection about the program and post-program experiences of program participants and associated statistical analyses. **Appendix C** documents data collection about earnings of program participants and associated statistical analyses. **Appendix D** gives technical details on how the team estimated the adjusted differences in outcomes by receipt of grant-funded services. **Appendix E** gives technical details on how the team estimated the program outcomes separately for each program. **Appendix F** documents how data about the programs were collected directly from grantee and program staff and associated statistical analyses. **Appendix G** provides supplemental detailed tables.

## 2. Study Design and Data Sources

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This chapter describes the research questions, data sources, and analysis methods for the outcomes study.<sup>14</sup> It begins with the TAACCCT capacity-building theory of change, which underlies the research questions and data collection efforts.

The implementation analysis is designed to document the implementation of grant-funded strategies. The outcomes analysis is designed to describe the characteristics of participants in the 34 programs who agreed to be part of the study; their training and service receipt; and various education, employment, earnings, and public assistance benefits receipt outcomes about 15 months after program entry. It then explores program performance by participant outcomes. Finally, the chapter discusses the study's limitations.

### 2.1. CAPACITY-BUILDING THEORY OF CHANGE

**Exhibit 2-1** depicts the TAACCCT capacity-building theory of change.<sup>15</sup> Such theories of change provide an organizing framework for assessing the implementation of grant activities and how they are hypothesized to lead to improved outcomes for participants and grantees. **Exhibit 2-1** highlights outcomes experienced by *participants*. Although grantees also had capacity-building outcomes, participant outcomes are highlighted here because they are the focus of this report.<sup>16</sup>

Starting at the left, the exhibit shows three types of **program inputs**. First are the grantees' efforts to develop and enhance their education and training programs and build capacity to serve adult learners. Grantees built on existing programs and physical infrastructure, such as classrooms, labs, and skills practice environments where training occurs, and on institutional infrastructure, such as faculty. Contributing to those effects are partnerships, which could be internal to the college, such as campus services, administrators, and other departments, and external to the college, such as employers and the public workforce system.

The second type of input is the participants who need skill upgrades or new training to compete in the labor market or advance in their careers. Participants include TAA-eligible workers and other adult learners who need training, such as veterans and incumbent workers.

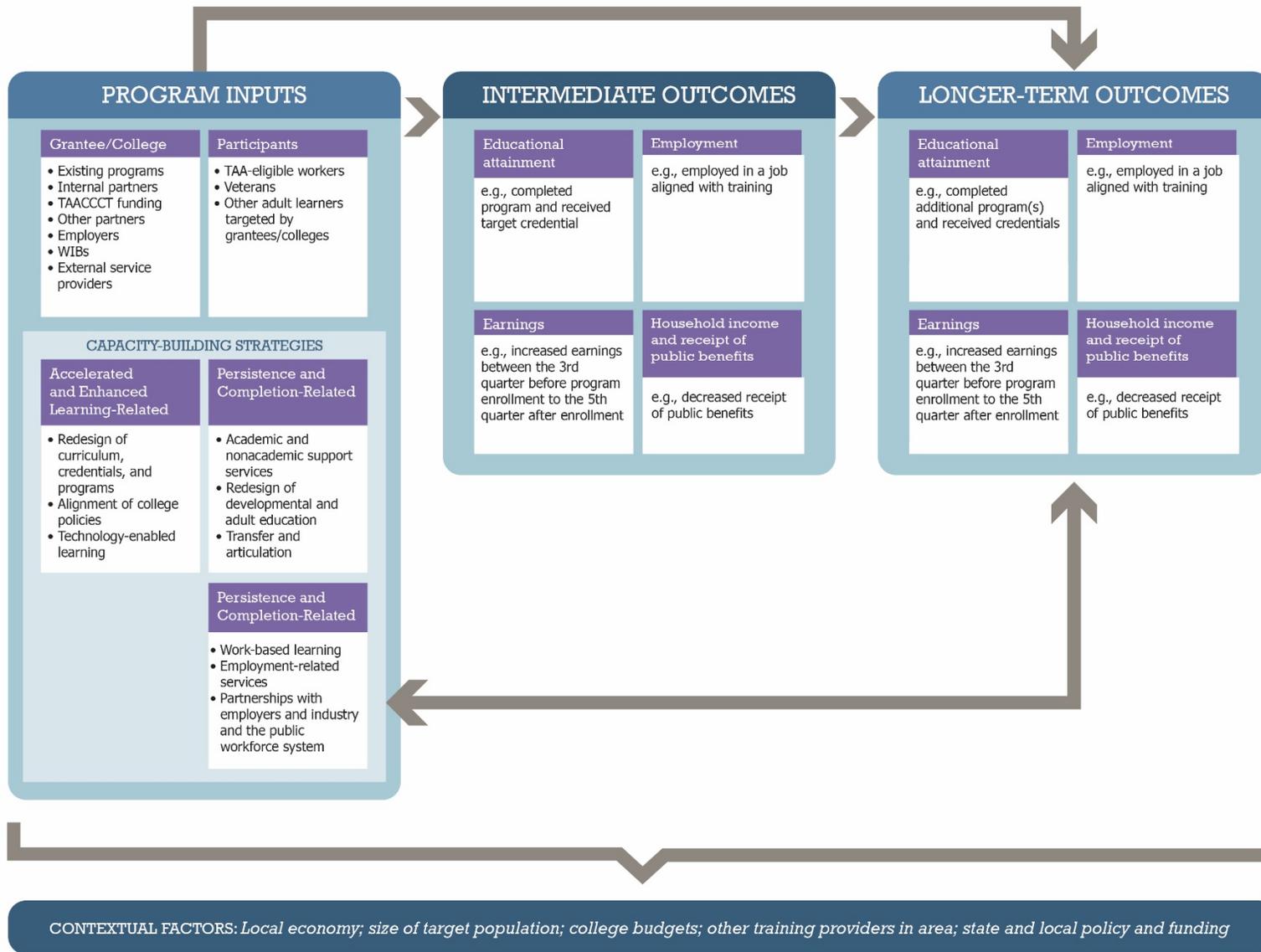
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<sup>14</sup> Designs for the implementation study and the outcomes study are described in detail in the *Evaluation Design Report* (Abt Associates 2017).

<sup>15</sup> This theory of change builds from the frameworks presented in the Rounds 1 and 2 and Round 3 TAACCCT synthesis reports (Eyster 2020; Kuehn and Eyster 2020; Scott et al. 2020). It also builds on theories of change developed for other recent evaluations of occupational training programs (see, for example, Fein 2012; Werner et al 2013).

<sup>16</sup> For detail on the outcomes experienced by the colleges, see (Trutko et al. 2020).

Exhibit 2-1. Theory of Change



The third type of input is **capacity-building strategies**:



- **Accelerated and enhanced learning strategies** to reduce adult learners' time to complete training programs, such as curriculum redesign to create career pathways or stackable credentials, technology-enabled learning, transfer credits, and credits for prior learning.



- **Persistence and completion strategies** to support adult learners' enrollment in, progress in, and completion of training programs, such as academic advising (e.g., tutoring), nonacademic advising (case management), financial aid advising, career counseling, and nonacademic skills courses (e.g., life skills).



- **Connections to employment strategies** to connect adult learners to the workforce, such as work-based learning strategies (skills practice in physical or virtual environments, internships and apprenticeships) and employment services (job search or placement assistance and interviewing practice).

The middle column in the framework is **intermediate outcomes** for participants; that is how grant-funded activities were expected to affect participants in the short-term. This includes program completion; employment closely related to training; increased earnings; and reduced use of public assistance benefits.

The column on the right shows **longer-term outcomes** for participants who complete their programs. These include enrolling in additional trainings, obtaining additional credentials, progressing in their employment, and further increasing their earnings.

Finally, **contextual factors** can influence both the implementation of grant activities and its outcomes. For example, local economic conditions can affect the supply of potential participants for programs as well as the availability of jobs for program completers.

## 2.2. DESIGN FOR IMPLEMENTATION ANALYSIS

The implementation analysis (Chapter 3) assesses the design and implementation of the grant-funded activities. It focuses on *program inputs*, specifically the nine grantees and their implementation of the *capacity-building strategies*. The theory of change posits that inputs should affect *intermediate outcomes*, which are the focus of the outcomes study. Specifically, the implementation analysis explores the following research question:

*What were the primary grant-funded components of each of the nine outcomes study grantees and how were they implemented?*

The implementation analysis explores the design of the 34 programs selected to be included in the outcomes study, including the nature of their training delivery, supportive services available, and employment supports for program participants and completers.

The implementation analysis uses data collected using interviews and observations conducted during site visits to each of the nine grantees. Site visits occurred during Year 3 of the grants (March and April 2017), when programs and other grant activities were expected to be operating at a steady state. During

the visits, the research team met with staff associated with all 34 programs, which, depending on the grantee, was all its grant-funded programs or a subset of them.<sup>17</sup>

### 2.3. DESIGN FOR OUTCOMES ANALYSIS

The outcomes analysis documents the characteristics, experiences, education, earnings, income, and public assistance benefit receipt outcomes for program participants who enrolled in the 34 programs and agreed to participate in the study (see **Enrolling Study Participants** box). The outcomes study assesses *program inputs*, specifically the economic, demographic, and educational characteristics of the program participants, and *intermediate outcomes*.

Chapter 4 reports participant results for a number of intermediate outcomes, whereas subsequent chapters focus on four specific outcomes for detailed analyses by participant characteristic at program entry (Chapter 5), services received (Chapter 6), and program attended (Chapter 7).<sup>18</sup> The four focal outcomes are:

- **Program completion:** finishing the required classes *and* earning an associated credential within a year of program entry;<sup>19</sup>
- **Training-related employment:** employment in positions closely related to training (among participants who are *not* still enrolled in their program at the time of follow-up);
- **Change in earnings:** change in earnings between the third quarter prior to program entry and the fifth quarter following program entry<sup>20</sup> (among participants who were *not* still enrolled in their program at the time of follow-up); and
- **Public assistance benefit receipt:** receipt of means-tested public assistance (including Temporary Assistance for Needy Families and Supplemental Nutrition Assistance Program) as well as other federally funded assistance programs (e.g., TRA and Social Security Disability Insurance).

The team selected these four because they are the central intermediate outcomes in the theory of change, and because they range from direct and early (e.g., program completion) to indirect and distal (e.g., public assistance benefit receipt). The underlying logic is that participants who complete their program and obtain training-related employment should experience earnings growth such that they would not need public assistance benefits.

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<sup>17</sup> Some programs did not lend themselves to inclusion in the outcomes study, most often because there was no identifiable point of study intake. The team conducted calls with grant staff in spring 2016 to identify grantees and programs to include in the outcomes study. Selected programs had to meet the criteria discussed in Section 1.2 above.

<sup>18</sup> The team narrowed to focus on four outcomes for presentation purposes. There are so many ways that each of the four outcomes is analyzed that the volume of analyses and their presentation would become unmanageable for a larger set of outcomes.

<sup>19</sup> Participants' *program entry* date was usually the first day of class.

<sup>20</sup> This period between Q(-3) and Q5 was the longest period available for the entire sample of study participants.

### Enrolling Study Participants

Colleges were responsible for enrolling training program participants in the outcomes study. The research team trained college staff on how to describe the study, explain informed consent, and administer a Baseline Information Form that collected participants' demographic, economic, and educational background information to those who consented to be in the study.

Staff administered the informed consent form and the Baseline Information Form in class at the beginning of the training program. All study participants attended at least one class session of their program. Staff described the study to all program participants enrolled in the target programs.

Program entry (enrollment in the study) began in August 2016 and ended in October 2017. Grantees' reported consent rates varied by program and ranged from a high of 100 percent to a low of 60 percent.

The outcomes study explores these specific research questions:

- 1. What were the characteristics of study participants?*
- 2. In which features of training programs and services did study participants engage? What college and partner (e.g., workforce agency) services did they receive? What were their assessments of the services they received?*
- 3. What education outcomes did study participants in short-term training programs achieve? Did they see themselves on a career pathway? What were their plans for future training? What was the expected timeline?*
- 4. Did participants obtain employment? If so, was this employment in the occupation for which they trained? What were their earnings? How did it compare to their earnings prior to entering their training programs? What were the characteristics of their jobs?*
- 5. Did household income change? Were study participants less likely to receive public assistance benefits at follow-up than at program entry?*
- 6. Which subgroups of participants were most likely to complete grant-funded programs? Begin jobs in their occupation of training? Have higher post-training earnings?*
- 7. Do study participants who utilize various services have better outcomes, after controlling for characteristics at program entry?*
- 8. How did success rates (program completion, training-related employment, change in earnings, and public assistance benefits receipt) vary across programs and grantees?*

## 2.4. DATA SOURCES

Three data sources supported the outcomes study:<sup>21</sup>

- **Baseline Information Form.** Study participants who consented to be in the study completed a Baseline Information Form, which collected detailed demographic and socioeconomic characteristics, including educational and training background. In addition, it collected each study participant's employment history as well as information on current wages and earnings, public assistance benefits receipt, and total household income. The team modeled the Baseline Information Form on forms developed for evaluations of other DOL grant programs.<sup>22</sup> Other than counts by grantee (see Appendix Section A.1), no data were retained about the participants who did not consent to be in the study.
- **Participant Follow-Up Survey.** The follow-up survey, administered approximately 15 months following program entry, collected information on training receipt, perceived training quality, and educational progress; training-related supports; employment characteristics; and income and public assistance benefit receipt. Survey administration started 12 months after program entry, and many interviews were administered in month 12. However, interviewing efforts continued for additional months to increase response rates.<sup>23</sup>
- **National Directory of New Hires (NDNH).** This national database includes new hire dates, quarterly wages, and Unemployment Insurance benefit data.<sup>24</sup> The team used NDNH quarterly wage data to assess study participants' earnings and employment status. Because the NDNH captures information for all jobs covered by Unemployment Insurance as well as most federal jobs, for the outcomes study it included near-complete coverage of all formal employment for study participants who provided a valid Social Security number for matching.<sup>25</sup> NDNH data analysis focused on quarterly employment levels and earnings three quarters prior to program entry and five quarters after program entry, which was the longest period available for the entire sample.

## 2.5. ANALYSIS METHODS

The research questions required varied analysis methods. As discussed in Section 1.2, the research team estimated average outcomes for participants, as well as ranges for estimates that reflect plausible errors in extrapolating from these results to a hypothetical future round of TAACCCT-like grants. To answer Research Question 7 about the relationships between services and outcomes, the team speculated about what these relationships would be if participants opting to use a given service had the same baseline profile as those opting not to use it. Finally, to answer Research Question 8 about the variability in

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<sup>21</sup> Data collection instruments are available at [https://www.reginfo.gov/public/do/PRAViewICR?ref\\_nbr=201505-1291-001](https://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201505-1291-001) and [https://www.reginfo.gov/public/do/PRAViewICR?ref\\_nbr=201608-1291-001](https://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201608-1291-001).

<sup>22</sup> Those evaluations are Evaluation of Green Jobs and Health Care Grantees and the Evaluation of the Impact of the H-1B Technical Skills Training Grants.

<sup>23</sup> The team used three survey modes: web administration, followed by telephone follow-up, and finally in-person follow-up. The survey had an 80 percent response rate. Most of the interviews took place between 12 and 15 months after the participant's program entry date (which was usually the first day of class). The median lag was 14.8 months. However, 6 percent of interviews took place as soon as 10 or 11 months after program entry, and 33 percent took place 16 months or longer after program entry. The longest lag from program entry to interview was just less than two years.

<sup>24</sup> The NDNH is maintained by the Office of Child Support Enforcement in the U.S. Department of Health and Human Services.

<sup>25</sup> About 85 percent of participants provided a valid SSN for matching with the NDNH.

outcomes across programs, the team speculated about how these differences would have diminished if the sample sizes had been larger in each program. More details are provided below and technical details are included in the appendices.

- *To answer Research Questions 1 through 5 (Chapter 4)*, the research team calculated simple averages and percentages along with corresponding estimated standard errors and 95 percent confidence intervals for all participants. Given the small sample sizes for many of the programs, the team ran the tabulations on the pooled set of 34 programs. Standard errors for the pooled estimates reflect variation in success rates across the programs as well as variation within programs. Based on these standard errors, the team computed 95 percent confidence intervals for each outcome. A *confidence interval* is a measure of uncertainty. Though there is very little uncertainty about outcomes for the participants who enrolled in the 34 programs during the study period, there is considerable uncertainty about outcomes for future participants—especially what outcomes might be for those who enroll in programs offered by new grantees if there were another round of grants or similar type of grant programs. The confidence intervals in this report represent the range of possible outcome levels that would be expected for programs from a new round of grants, assuming the same general economic conditions and same grant competition rules.<sup>26</sup> For more information on how to interpret these confidence intervals and on how they were calculated, please see Appendix Sections A.4 and B.5.<sup>27</sup>
- *To answer Research Question 6 (Chapter 5)*, the team estimated outcomes for a set of subgroups defined by participants' demographic, economic, and educational characteristics at program entry. Differences between complementary subgroups (e.g., males and females) were formally tested to determine whether differences are large enough relative to sampling error to form a reasonable basis for extrapolation to future hypothetical grants, assuming the same general economic conditions and same grant competition rules. The objective of subgroup analyses is to determine which groups consistently benefit more from these sorts of training programs.<sup>28</sup>
- *To answer Research Question 7 (Chapter 6)*, the team explored which grant-funded services were associated with better and worse outcomes for participants, after accounting for known differences at study enrollment. The answers to this research question are more tentative than those to the earlier research questions. In order to determine whether receiving a service during training leads to a better outcome than not receiving it, the research team used different analytical methods than for the prior research questions. These methods make strong implicit assumptions about what led participants to receive the services. More specifically, based on characteristics of participants at program entry and on the nature of the program, the research team built statistical models for “counterfactual” outcomes—the outcomes that participants who received the service would have experienced if they had *not* received the service—as well as for the outcomes that participants who did not receive the service would have experienced if they *had* received the service. If these models are accurate, then the estimated impacts should be useful as a guide to future program design.

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<sup>26</sup> These intervals would not apply during the COVID-19 pandemic, but could do so in a few years, near the end of the next expansionary business cycle.

<sup>27</sup> These confidence intervals are narrower for outcomes with similar averages across programs and wider for outcomes with highly disparate averages across programs. The logic is that if the 34 programs all led to similar averages for an outcome, then a future round of grantees should also lead to a narrow range of averages for that outcome; but if the 34 programs lead to wildly different averages for an outcome, then it is much more difficult to predict the average for that outcome for a future round of grants.

<sup>28</sup> If the difference between two subgroups is consistent across the 34 programs, then the difference between the subgroups can be statistically significant even if the confidence intervals for the two subgroups overlap.

Conversely, if these models are flawed, the estimated impacts may serve as a misleading guide to future program design. This methodology is equivalent to a series of “quasi-experimental designs” (QEDs) in which participants that received a service are the “treatment” group and those who did not are the “control” group, and regression analysis is used to remove observed confounding. Full details on these methods are provided in Appendix D.

- *To answer Research Question 8 (Chapter 7),* the team used another type of modeling to estimate program-specific outcomes. The participant sample sizes were too small in most programs for the simple program-specific average to serve as a useful guide for the likely experiences of future cohorts of program participants. Instead, the team built models for what would have happened in each program if it had an adequate sample size; that is, if it enrolled a large number of participants similar to those who did enroll. Predictions from these models tend to shift extreme outcome rates based on small sample sizes closer to overall outcome rates. This methodology is equivalent “small area estimation” (SAE). Federal statistical agencies in a variety of countries use these methods to publish estimates for localities with small or even zero sample sizes. In this application, the programs serve as “areas.” Full details on these methods, including academic references to similar work, are provided in Appendix E.

### 2.6. STUDY LIMITATIONS

This outcomes study has some limitations. First, the analyses are based on the experiences of participants who enrolled in 34 programs at nine grantees. The research team selected these grantees and programs based on specific criteria, as noted above. Thus, the grantees and programs are not representative of all Round 4 grantees and grant-supported programs. This limits the generalizability of findings. Findings are generalizable to the extent that other grant-funded programs are similar to the programs selected for the study in terms of duration, credential timing, in possessing a specific point of entry, and in operating in a specific economic environment. The last point is particularly important given that the outcomes were mostly measured in 2018, a time period when unemployment was low.

Second, the follow-up period is relatively short and many of the interviews were conducted during the preceding three months. Thus, caution should be used in interpreting the findings. Fifteen months after program entry is likely to be too early to capture important changes in employment and earnings outcomes. In fact, a few of the programs in the study were intended to last more than 12 months. Where appropriate, participants who were still in training were excluded from analyses. A longer reference period would allow the inclusion of such participants in those analyses.

Third, except for the analysis in Chapter 6, the study lacks a control group, thus outcomes reported for the full study sample cannot be characterized as better or worse than participants would have achieved without access to the program.<sup>29</sup> Other potential study limitations related to specific analyses are discussed in the relevant chapters.

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<sup>29</sup> The research team explored the feasibility of conducting an experimental study with a control group, which was the primary reason that a key selection criterion was the program having a specific point of entry. The team abandoned this design once it was clear that demand for most programs was considerably lower than anticipated, thus making an experimental design infeasible. The team also considered developing a comparison group using data from participants in another study (or studies), but this approach ran into difficulties obtaining permission to use participant records from studies of sufficiently similar populations.

## 3. Implementation Findings

This chapter describes grant-funded strategies implemented by the nine grantees in the outcomes study. It addresses the following research question:<sup>30</sup>

*What were the primary grant-funded components of the nine outcomes study grantees and how were they implemented?*

The chapter uses the three capacity-building strategy categories described in the theory of change as a framework for describing grantee implementation activities: ***accelerated and enhanced learning, persistence and completion***, and ***connections to employment*** (work-based learning and job search strategies). The substrategies within each capacity-building strategy category are informed by DOL priorities articulated in the Round 4 grant funding announcement.

Though the focus of this report is on outcomes associated with the 34 programs, this chapter describes both grantee-level and program-level strategy implementation. Because grant-funded strategies often support multiple programs, overall grantee strategies are described first, followed by program-specific examples.

This chapter begins with an overview of the 34 programs included in the outcomes study, including key strategies. It then describes grantees' implementation of each capacity-building strategy.

### 3.1. OVERVIEW OF PROGRAMS

The nine grantees' 34 programs spanned six industries: manufacturing, information technology (IT), welding, construction, health care, and transportation/warehousing. **Exhibit 3-1** groups programs by industry and for each program summarizes its intended length, associated credential(s), and key strategies. The most common strategies implemented were related to the strategies of accelerated and enhanced learning and connections to employment.

#### Key Takeaways: Implementation Findings

- All grantees designed new or enhanced existing career pathways or developed new stackable credentials.
- Eight grantees implemented at least one technology-enabled learning strategy.
- Five grantees implemented prior learning assessments or awarded credit for prior learning.
- All grantees implemented a new learning structure for their training programs.
- Grantees used grant funds to provide a range of academic supports.
- Grantees implemented a range of nonacademic supports.
- All nine grantees implemented skills practice strategies.
- Seven grantees provided job search services.
- Internships were the most common work-based learning activities among grantees.

<sup>30</sup> This chapter complements findings in a separate implementation report that used a survey administered to all Round 4 colleges (Trutko et al. 2020).

Exhibit 3-1. Program Length, Credentials, and Strategies Used, by Industry

 <b>Advanced Manufacturing</b>			
Program and Grantee	Program Length (months)	Credential Types	Primary Strategies Implemented
Fast Track to Manufacturing; <b>Bossier Parish Community College</b>	1	MSSC Certified Production Technician certification	Stacked & latticed credentials, hybrid & self-paced learning, <i>skills training</i>
Advanced Manufacturing and Engineering, <b>Chaffey College</b>	3	National Career Readiness Certificate stackable credential leading to a portfolio of credentials	<i>Skills practice, career boot camp, navigator</i>
HVAC, <b>Chaffey College</b>	11	EPA 608 license in refrigerant management North American Technician Excellence certification	<i>Equipment for skills practice, internships, accelerated &amp; contextualized curriculum development</i>
Industrial Automation, <b>Chaffey College</b>	7	Industrial Automation certificate	Accelerated and cohort-styled curriculum, <i>skills practice, employability skills workshop</i>
Industrial Maintenance, <b>Chaffey College</b>	3	NCCER Industrial Maintenance certificate	<i>InTech Center (skills practice); 3 training pathways, stackable credentials, supportive services, job search assistance</i>
Mechanical Craft, <b>Chaffey College</b>	5	Portfolio of NCCER certificates	<i>Equipment for skills practice, updated modularized curriculum</i>
Pre-engineering, <b>Chaffey College</b>	3	Portfolio of NCCER certificates	<i>InTech Center (skills practice), supportive services, job search assistance</i>
TECH 101, <b>Delgado Community College</b>	4	NCCER Core certificate	<i>Program navigators, career developer, academic supports, articulation agreement, equipment, skills training, hybrid instruction</i>
Core Plus, <b>Delgado Community College</b>	4	NCCER Core certificate	
Advanced Manufacturing; <b>Manchester Community College</b>	8	Advanced Manufacturing Machine Technology certificate Precision Manufacturing certificate	<i>Facility renovation and equipment for skills practice, stackable credentials, expanded program to new colleges/target populations</i>

## CHAPTER 3: IMPLEMENTATION FINDINGS

Certified Production Technician, <b>South Central College</b>	4	MSSC Certified Production Technician certification	<p><i>Career pathways, online course, equipment for skills practice in physical environment and virtual environment, <a href="#">academic advising</a>, <a href="#">job search assistance</a></i></p>
Machining, <b>South Central College</b>	8	Examples include CNC Certificate Machine Operator Right Skills Now Certificate CNC Toolmaking Diploma Machining Technician Diploma CNC Precision Manufacturing Technician Diploma CNC Manufacturing Technician AAS	
Mechatronics, <b>South Central College</b>	16	Industrial Maintenance Certificate Mechatronics Diploma Automation and Robotics Systems Diploma Mechatronics AAS Automation and Robotics AAS	
Right Skills Now; <b>South Central College</b>	8	Machine Operator Right Skills Now Certificate	
 <span style="font-size: 1.2em; font-weight: bold;">Construction</span>			
Program and Grantee	Program Length (months)	Credential Types	Primary Strategies Implemented
Training for Manufactured Construction (TRAMCON) Advanced, <b>Miami Dade College</b>	6	NCCER Manufactured Construction Level 2	<p><i>Stackable credentials, Transformative Learning Centers (skills practice), <a href="#">recruitment/retention/completion specialist</a>, <a href="#">job search assistance</a></i></p>
TRAMCON Basic, <b>Miami Dade College</b>	3	NCCER Level 1 certification	
TRAMCON Foundation, <b>Miami Dade College</b>	3	NCCER Core certification	

## CHAPTER 3: IMPLEMENTATION FINDINGS

 <b>Health care</b>			
Program and Grantee	Program Length (months)	Credential Types	Primary Strategies Implemented
Emergency Medical Technician, <b>Washburn University</b>	5	EMT licensing exam	<i>Regional Simulation Center (skills practice), observations, <a href="#">career navigator</a>, hybrid instruction</i>
Licensed Practical Nurse, <b>Washburn University</b>	8	NCLEX-PN to become an LPN TeamSTEPPS certificate	<i>Sim Center (skills practice), <a href="#">workplace skills curriculum</a>, <a href="#">career navigator</a>, <a href="#">articulation agreement</a>, transfer credits</i>
 <b>Information Technology</b>			
Program and Grantee	Program Length (months)	Credential Types	Primary Strategies Implemented
Software Development, <b>Ivy Tech*</b>	14	Technical Certificates in Software Development, Java Application Dev., Web Application Dev	<b>Career pathway virtual advising tool; online instruction, skills training in physical environment, skills training in virtual environment (data centers)</b>
Computer Science, <b>Ivy Tech*</b>	24	AAS Transfer Single Articulation Pathways	
Cyber Security, Information Assurance, <b>Ivy Tech*</b>	21	Certificates in Digital Forensics, Network Penetration, Network Security, Technical Certificate in Cyber Security	
IT Support, <b>Ivy Tech*</b>	10	Certificate in IT Support & IT help desk	
Network Infrastructure, <b>Ivy Tech*</b>	14	Certificate in Routing and Switching, Tech Certificate in Network Infrastructure	
Server Administration, <b>Ivy Tech*</b>	21	Certificates in Linux Administration, Microsoft Administration; Technical Certificate in Server Administration	
Database Management, <b>Ivy Tech*</b>	21	Certificates in Data Analytics, Database Administration, Technical Certificate in Database Mgmt. and Administration	
Informatics, <b>Ivy Tech*</b>	18	Technical Certificate in Informatics Certificate in Informatics	
NETI 105, ITSP 135, <b>Ivy Tech*</b>	4	Various industry certifications	

 <b>Transportation and Warehousing</b>			
Program and Grantee	Program Length (months)	Credential Types	Primary Strategies Implemented
Commercial Driver's License and Forklift, <b>Cincinnati State Technical College</b>	0.25	JJ Keller Forklift Operation certification Commercial Drivers' License	<i>Skills training in physical environment, <u>academic support (tutoring)</u>, <u>job placement assistance</u></i>
 <b>Welding, Multiple Grantees</b>			
Program and Grantee	Program Length (months)	Credential Types	Primary Strategies Implemented
Advanced Welding and Bootcamp, <b>Bossier Parish Community College</b>	4	AWS Certified Welding Supervisor AWS Certified Welding Inspector	<i>Equipment &amp; facility for skills practice; <u>academic supports</u>, <u>accelerated boot camp</u></i>
Welding, Chaffey College	18	AWS sequence of credentials	<i>Equipment for skills practice</i>
Welding Technology, <b>Manchester Community College</b>	8	Advanced Manufacturing Welding Technology certificate	<i>Equipment for skills practice; <u>stackable credentials</u></i>
Welding, <b>South Central College</b>	4	AWS sequence of credentials	<i>Equipment for skills practice in virtual environment</i>
Welding Technology, <b>Washburn University</b>	5	AWS sequence of credentials	<i>Welding training facility (skills practice), <u>accelerated curriculum</u>, <u>stackable credentials</u>, <u>Credit for Prior Learning (Vets)</u></i>

**Credential abbreviations**

Manufacturing Skill Standards Council (MSSC)  
 American Welding Society (AWS)  
 National Center for Construction Education & Research (NCCER)

**Key**

Accelerated and enhanced learning strategies  
Persistence and completion strategies  
*Employment connections—work-based learning strategies*  
Employment connections—employment services strategies

\* Sample of Ivy Tech certificates and degrees; most programs include associate degrees (not listed)

Source: Implementation site visits, conducted March and April 2017.

**Manufacturing.** The greatest number of outcomes study programs (14) were manufacturing related. Five grantees implemented these programs, which ranged in length from one month to 16 months. Resulting credentials were industry specific, including those provided by entities such as the Manufacturing Skill Standards Council and the National Center for Construction Education & Research. The most common grantee-funded strategies for these types of programs were in the areas of connections to employment (equipment and facilities for physical skills practice) and accelerated and enhanced learning (creating or enhancing programs within a career pathway).

**Information Technology.** The next most common industry was IT. One grantee operated all nine of the studied IT programs. Program length ranged from four months for gateway programs to 24 months. Grantee-implemented strategies were related to connections to employment (skills practice in both physical and virtual settings) and accelerated and enhanced learning (technology-based learning).

**Welding.** The outcomes study included five welding programs, operated by five grantees. They ranged in length from four to 18 months and resulted in American Welding Society credentials. Grantees used funds for strategies in the connection to employment category, primarily purchasing welding equipment and expanding welding facilities in order to provide more opportunities for skills practice.

**Other.** Less common industries were construction, health care, and transportation/warehousing. One grantee implemented three construction programs, ranging in length from three to six months. This grantee's funded strategies were connection to employment (space and equipment for skills training) and accelerated and enhanced learning (creation of stackable credentials). One grantee implemented two health care programs, ranging in length from five to eight months. The strategies implemented were connections to employment (creation of a simulation center for skills practice), accelerated and enhanced learning (creation of a new credential), and persistence and completion (funding for a career navigator). Finally, one grantee operated a transportation program and a warehousing program. This grantee's strategies were related to connections to employment (equipment purchase and development of a training facility to enable hands-on skills practice).

### 3.2. ACCELERATED AND ENHANCED LEARNING STRATEGIES



This section discusses grantees' funding of accelerated and enhanced learning strategies. The grantees used grant funds to develop and enhance career pathways programs, employed a variety of technology-enabled learning techniques, and made adjustments to the structure and timing of teaching and learning (modularized, self-paced). Grantees also implemented credit for prior learning or prior learning assessments.

**All grantees designed new or enhanced existing career pathways or developed new stackable credentials.**

The Round 4 grant solicitation emphasized career pathways and stackable credentials. The grantees took a variety of approaches across different industries.

**Accelerated and Enhanced Learning Strategies Defined**

**Career Pathways:** Approaches that offer articulated education and training steps between occupations within an industry sector, combined with support services, to enable individuals to enter and exit the job market at various levels and to advance over time to higher skills, recognized credentials, and better jobs with higher pay.

**Technology-Enabled Learning:** Strategies that use technology to effectively teach content to participants, enable participants to teach themselves, or enable participants to learn from one another. Examples include entirely online courses and hybrid courses.

**Prior Learning Assessment, Credit for Prior Learning:** A prior learning assessment is an evaluation of skills and knowledge acquired outside the classroom for the purpose of recognizing competence against a given set of standards, competencies, or learning outcomes. Credits are awarded based on this assessment.

Credit for prior learning is also awarded for non-credit or professional development certificates, apprenticeship certificates.

**Structure of Learning:** Strategies include modularized learning in which modules are conceptualized as self-contained “units”, and self-paced learning.

**Stackable Credentials:** A sequence of certificates or credentials that can be accumulated over time and move an individual along a career pathway or up a career ladder.

Examples of **career pathways**:

- Each college in the *South Central College consortium* developed a **career pathway** for its advanced manufacturing programs that incorporated the Manufacturing Skill Standards Council’s Certified Production Technician credential as an entry-level certificate that transferred to more advanced diploma and degree programs. The credential comprised of four core courses that colleges embedded into several advanced manufacturing pathways in machining and mechatronics.
- Through its grant-funded InTech Center (see Section 3.4), *Chaffey College* supported participants entering and advancing through **multiple pathways**, particularly in the industrial maintenance program, which had heating, ventilation, and air conditioning, industrial-electrical, and industrial-mechanical pathways. The three training pathways prepared graduates for employment as an industrial maintenance technician. Participants could enter the program through any of the pathways and could earn credentials in multiple pathways.

Examples of **stackable credentials**:

- The *Miami Dade College consortium* designed a four-level training for a manufactured construction program to introduce participants to the core skills required in the industry. The four levels—foundation, basic, advanced, and supervisory—each culminated in a **stackable credential**.<sup>31</sup> Participants began in the foundation program and proceeded through the program levels in

<sup>31</sup> The supervisory program was not included in the outcomes study because no participant had reached the fourth level at the time study enrollment began.

sequence. Participants could earn up to seven industry-recognized credentials if they completed all four levels.

- Colleges in the *Manchester Community College consortium* enhanced their existing advanced manufacturing programs to incorporate **stackable third-semester credentials**. Staff based each third-semester certificate on competencies employers identified as necessary for the job. Rather than writing a detailed curriculum that could become obsolete in the advanced manufacturing field before it was completed, program staff worked backwards from exit competencies identified by employers to create learning objectives and develop a course syllabus. For example, Asnuntuck Community College developed certificates in additive manufacturing, advanced machining technology, CAD/CAM programming, quality inspection, and metal fabrication. When the certificates are approved by the Connecticut Board of Regents, program participants will be able to stack credentials by attending training for one additional semester. Therefore, according to grant staff, the third-semester certificates were more focused and better suited to participants who already completed the core advanced manufacturing program or who already had experience working in manufacturing.

### | Eight grantees implemented at least one technology-enabled learning strategy.

Grantee approaches to **technology-enabled learning strategies** included hybrid learning (where instruction is delivered both online and in person), online teaching and learning, and real-time online instruction. For example:

- At *Ivy Tech Community College*, IT program participants could take courses in a variety of formats, including exclusively online. This allowed participants to take courses from any of the college's campuses, regardless of whether that course was offered at the physical campus they attended. Using grant funds, the college developed and revised curricula for online courses and offered **new trainings to faculty**. According to grant staff, the **new and enhanced online courses** increased participants' access to training opportunities, especially in smaller and more rural areas where there were not enough participants to offer certain courses in person.
- The *South Central College consortium* used grant funds to develop +Connect, an **online mediated telepresence classroom** that allowed participants to attend classes remotely. +Connect courses were targeted at incumbent workers and those in apprenticeship or dual-training programs who did not have time to travel to or attend traditional in-person classes. They created +Connect in order to allow participants to work and earn a credential at the same time. In the mediated telepresence courses, participants could join an online co-space from any location; instructors could share PowerPoint slides, videos, and other media. Participants and instructors used cameras and microphones to communicate with each other.

At least one grantee found that planned technology-enabled learning techniques did not work for manufacturing program courses. This grantee explored creating hybrid classes for up to 10 advanced manufacturing courses that combined in-person lectures with online instruction. The grantee determined that advanced manufacturing courses were not good candidates for hybrid classes because few were lecture based and the majority involved extensive lab time. As of the research team's site visit, no hybrid classes had been created.

### Five grantees implemented prior learning assessments or awarded credit for prior learning.

Five colleges in the outcomes study implemented new prior learning assessments to assign participants credit for their prior educational or work experiences. For example:

- **Washburn University consortium** used grant funds to hire a **veteran specialist** who encouraged soon-to-be discharged military service members to apply to any of the programs of study. The veteran specialist helped establish **credit for prior learning for veterans** by aligning their skills acquired in the military with Kansas Board of Regents training program requirements. Veterans could enter their job code and level of expertise into an online system that then provided the number of credits the veteran could receive at programs in the Kansas postsecondary education system. During the grant period, the consortium developed veteran-related credit for prior learning for the physical therapy assistant program at Washburn University, the surgical technology program at Washburn Institute of Technology, and the welding technology program at Garden City Community College.
- **Manchester Community College** adapted its implementation of **credit for prior learning** for its advanced manufacturing programs after determining the field does not easily lend itself to prior learning assessments. The two primary assessment methods were problematic. Evaluation of a portfolio of work to demonstrate skills was not possible for manufacturing. Administration of a skills test was possible but would require instructors to develop their own assessments because there was no existing standard test of manufacturing skills and knowledge. According to grant staff, some instructors were open to implementing their own skills assessment but noted that there were few requests from participants. One program director noted that when participants did request an assessment, he allowed them to spend more class time practicing skills on machines and less time in lectures.
- **South Central College** grant staff worked with the college's Continuing Education and Customized Training department to measure competencies gained by participants who completed the non-credit certified production technician courses. If a course participant enrolled in a more advanced machining or mechatronics course, college staff assessed the participant's competencies to award **credit for prior learning**. According to grant staff, other colleges in the consortium developed similar arrangements.

### Most grantees implemented a new learning structure for their training programs.

Modularized learning, in particular, was common among manufacturing programs, especially those implementing industry-recognized National Center for Construction Education & Research and Manufacturing Skill Standards Council certifications. For example:

- In the foundation program in the **Miami Dade College consortium's** training for manufactured construction sequence, participants progressed through **performance evaluations** associated with each module. In each evaluation, participants had to demonstrate their competence in a specific skill. For example, at the conclusion of one module, participants had to show they could effectively use a handsaw to cut a wood 2x4. The foundation modules included hand tools, power tools, plan reading, communication, and employability skills. At the end of the modules, participants earned a National Center for Construction Education & Research Core certification.

- Two grantees used **self-paced learning** techniques in their grant-funded welding training programs. Instructors in *Bossier Parish Community College's* advanced welding program taught participants by using hands-on, self-paced learning techniques in the welding booth, a skills practice physical environment. Similarly, in the *Washburn University consortium*, Garden City Community College redesigned its welding program curriculum to include self-paced learning such that participants could prove competency in a weld and then progress to a more complicated one.

### 3.3. PERSISTENCE AND COMPLETION STRATEGIES



Five grantees used funds to hire and support staff who provided enhanced academic and nonacademic supports. In several cases, the same position (e.g., navigator, retention and completion specialist) provided both academic supports, such as tutoring, advising, and monitoring academic progress, and nonacademic supports, such as case management, goal setting, and connections to supportive services. Grantees implemented contextualized learning (e.g., math built into welding training programs), competency-based training (advancement to the next module or course based on skills attainment rather than seat time), and transfer and articulation policies.

Grantees used grant funds to provide a range of academic supports.

The nine outcomes study grantees implemented one-on-one advising, tutoring, and team teaching to support academic success. For example:

- Ivy Tech Community College* developed a **virtual career pathway advising tool** for its School of Information Technology. Because the programs of study in the school were closely related and had multiple overlapping course requirements, faculty found that program participants were taking multiple classes, but in combinations that did not meet the completion requirements of any program of study. This advising tool helped program participants choose a program of study and understand the jobs and associated salaries for which they would be trained. After the program participant chose a program, the tool mapped out course requirements, when those courses were offered, sequenced prerequisites, and recommended against certain “killer combinations” of difficult courses taken in the same semester.
- As part of grant activities, colleges in the *South Central College consortium* implemented “intrusive advising,” **one-on-one academic and career advising** that all program participants enrolled in a grant-funded program received. According to grant staff, the extent of advising was more intense and individualized than the traditional academic advising offered by the colleges. Intrusive advising included working with participants to detect and resolve persistence issues by monitoring program attendance, speaking with instructors, and interpreting the results of academic assessments.

#### Persistence and Completion Strategies Defined

##### Enhanced Academic Supports:

Examples include tutoring, academic advising (e.g., course planning), and academic preparation and course support (e.g., study skills).

**Nonacademic Supports:** Examples include case management, goal setting, referrals to supportive services, financial aid advising, and career counseling.

**Life Skills:** Examples include classes or advising on how to take tests, how to manage time, how to work well within a team, how to communicate, and how to manage personal finances.

- The *Washburn University consortium* allied health **career navigator** conducted in-class presentations to review each program’s requirements, length, and career pathway; assessed participants’ academic skills and provided referrals to supports as needed to help them persist in and complete the program; and offered one-on-one career and educational advising. The career navigator proactively distributed a list of commonly needed supports, such as assistance with study skills or test anxiety. This navigator worked with participants in two outcomes study programs— licensed practical nurse and emergency medical technician.
- One college in the *Chaffey College consortium* used grant funding to hire three **peer mentors** for its manufacturing program to serve as lab assistants, help instruct program participants, help run the tool room, and ensure that participants used lab equipment safely. According to grant staff, because peer mentors helped run the training equipment and labs, instructors had more time to spend on other activities, such as creating strong partnerships with employers, developing curriculum, and instructing participants.

Some grantees provided tutoring support, primarily related to basic skills:

- *Cincinnati State Technical and Community College* provided **academic support and tutoring** through a partnership with a community-based organization. There were no basic skills requirements at the college’s forklift training program. However, when participants demonstrated low basic skills, the college arranged one-on-one basic skills training with a tutor at the organization.
- One college in the *Miami Dade College consortium* integrated **academic support staff** into its **training** for manufactured construction programs. An instructor from the Adult Education department attended the first few semesters of the foundation course to provide help with reading and math. This instructor also provided **tutoring** as requested by participants.

One grantee integrated a team-teaching approach, developed under a prior round grant, into the two new Round 4 programs included in the outcomes study.

- *Delgado Community College* used grant funds to implement **team teaching** in the TECH 101 and Core Plus programs. The teaching team included the occupational skills instructor and a basic skills instructor. Modeled after the Washington State Integrated Basic and Education Skills Training program (I-BEST), the basic skills instructor was in class at least a quarter of the time and provided individual assistance to participants who needed additional support and supplemental instruction on foundational academic skills (e.g., basic math, reading, and writing). At times, the basic skills instructor participated in class discussions by asking the occupational instructor probing questions to clarify material that appeared to confuse participants.

### | Grantees implemented a range of nonacademic supports.

Grant-funded staff such as program navigators and recruitment, retention, and completion specialists provided nonacademic supports, either one-on-one or in classes. In some instances, the same staff provided academic and nonacademic supports. For example:

- At *Delgado Community College*, two **program navigators** provided case management to promote participant retention in and completion of programs. Navigators worked with each participant to create an Individual Service Strategy, a standardized form covering educational history, work history, transportation plans, history of involvement in the criminal justice system, supportive service needs (e.g., childcare, counseling, housing, legal assistance), professional goals, and an

action plan. The navigators helped participants with various logistics (e.g., registering for courses) and provided career advising.

- All colleges in the *Miami Dade College consortium* had at least one grant-funded **recruitment, retention, and completion specialist**. The specialists met with participants one-on-one to develop an individual learning plan that mapped participants’ goals and identified ways in which the specialists could assist with goal achievement. For example, a plan could explain how the specialist would connect the participant to supportive services, such as childcare or transportation assistance. The grantee encouraged but did not require participants to meet with a specialist.
- In addition to academic and career supports, the *Washburn University consortium* **career navigator** assessed participants’ social service needs and provided referrals to supports to help them persist in and complete the program. The career navigator’s list of commonly needed participant supports included information about a food pantry.

**Examples of Staff Providing Academic and Nonacademic Supports**

**Program Navigators (Delgado Community College):** Provided case management and served as a resource for participants to promote retention and completion.

**Recruitment, Retention, and Completion Specialists (Miami Dade College consortium):** Developed individual learning plans and assisted participants with goal achievement.

**Career Navigators (Washburn University consortium):** Provided information about program requirements, offered one-on-one career and academic advising, assessed participants’ social service needs, and provided referrals to supports.

**Intrusive Advisors (South Central College consortium):** Provided one-on-one academic and career advising. Worked with participants to detect and resolve persistence issues.

**Career Coaches (Bossier Parish Community College):** Provided academic advising, set goals with participants, and assisted with resume development and interview preparation.

Finally, one grantee implemented training to help participants prepare for work in a multi-disciplinary environment:

- In response to local employers’ requests that all allied health program participants be prepared to work in a multi-disciplinary environment, the *Washburn University consortium* purchased and implemented TeamSTEPPS (Team Strategies & Tools to Enhance Performance and Patient Safety) training. TeamSTEPPS taught **health care communication strategies** and helped participants understand the roles and responsibilities of various health care providers with whom they may work after completing training.

| Grantees also implemented strategies to award credit for non-credit course completion.

Examples of articulation from non-credit to credit:

- The *Miami Dade College consortium* developed agreements within their own colleges that allowed for the grant-funded training for manufactured construction programs and credentials earned to count for **credit in more advanced degree programs**. Such credits were awarded even though the programs were not for credit. For example, at Miami Dade College, the sequence of four programs together counted for 15 to 17 credits in the college's construction and architecture degree programs. At Seminole State College, each credential that participants received through the programs counted for credit in the college's construction management associate's degree program. Participants could earn up to 11 credits if they received credentials associated with all four program levels.

Finally, one grantee implemented an articulation agreement to help graduates of a for-credit program transfer credit to another institution of higher learning for a subsequent degree:

- As part of the *Washburn University consortium's* grant activities, Washburn Institute of Technology executed a new **articulation agreement** with Washburn University. The agreement allowed practical nursing participants to bring 18 credits to Washburn University's Bachelor of Science in nursing program. An earlier version of the agreement had capped the number of credits at 12. The articulation agreement allowed practical nursing program completers to take one fewer course each semester while training for their bachelor's, which gave them flexibility to work while attending school. According to instructors, this type of articulation agreement was relatively rare in nursing. Many programs articulate between an associate's and bachelor's degrees in nursing but they do not connect with a practical nursing program.

### 3.4. CONNECTIONS TO EMPLOYMENT STRATEGIES



Connections to employment strategies include work-based learning strategies (e.g., skills practice in physical or virtual physical environments and in-program work experience) and employment-related services (e.g., job placement services and interviewing practice).

All grantees implemented work-based learning strategies, primarily skills practice. Seven grantees offered in-program work experience. Grantees also implemented a number of job search assistance activities (e.g., help with resume development, interview preparation, connections to specific job opportunities). Three outcomes study grantees offered internship opportunities.

All nine grantees implemented skills practice strategies.

The grantees purchased various types of equipment that enabled participants to engage in simulations, in either a physical or virtual setting. Colleges implemented simulated learning techniques in diverse fields, ranging from manufacturing to health care to information technology. For example:

- **Ivy Tech Community College** used a large portion of the grant for new or updated computer labs and physical and virtual data centers. The college bought **new computers** to upgrade old labs, to expand labs at campuses with high numbers of IT program participants, and to create **new labs** at campuses that previously did not have any. According to grant staff, these investments helped ensure that all program participants had access to computer labs, and they allowed instructors to increase the amount of time spent in class providing hands-on skill-building lessons. The college also built both **physical and virtual data centers** with servers and networks so program participants could practice building and maintaining networks.
- The **Washburn University consortium** used grant funds to develop the **Regional Simulation Center** (Sim Center), a state-of-the-art center in which allied health profession participants could practice their diagnostic and treatment skills and could work in an integrated, “real life” setting. For example, a participant could practice helping a patient recovering from hip surgery navigate the restroom, key in the requisite codes to dispense medication from a locked medicine cabinet, or provide instrument assistance during a surgery. The Sim Center was designed to look like a hospital, with an operating room, nurses’ station, and other hospital settings. Instructors in the consortium’s licensed practical nurse program used the facility four times per semester to enable program participants to practice skills via simulations.
- The **Chaffey College consortium’s** major investment was its **InTech Center**, which supported training in industrial maintenance, pre-engineering, solid works, and 3-D manufacturing. The Center has multiple skills practice workstations, such as welding booths, a warehouse, and conveyor belts, to provide hands-on training to program participants. The grantee used funds to purchase equipment, such as a forklift simulator. The grantee also funded equipment that enhanced training delivery, such as a welding simulator.
- Each college in the **Miami Dade College consortium** had a **Transformative Learning Center**, a high-tech woodshop and lab. The Transformative Learning Centers varied in size across colleges. Staff at all three outcomes study colleges reported the labs gave program participants the opportunity to learn concepts firsthand, which in turn helped them learn the material faster.

Connections to Employment Strategies

**Work-Based Learning:** Examples include

- Practicing skills through simulations in a virtual setting
- Training in a work-like physical environment
- In-program work experience (e.g., internships, clinical placements, apprenticeships)

**Employment Services:** Examples include

- Job developers to identify potential openings
- One-on-one assistance or workshops to prepare for job search, including assistance looking for jobs, creating resumes, practicing interview skills, filling out job applications

Simulation opportunities were particularly common among welding programs. For example:

- ***Bossier Parish Community College*** used grant funds to purchase **welding booths and a welding simulator**. The welding simulator allowed participants to learn proper welding techniques in a virtual setting without the need for consumables, such as metal and gas. The simulator provided the look and feel of a real welding machine. Participants used a welding gun to perform welds in a virtual environment displayed through a screen in their helmet. They could interact with workpieces in the virtual environment using their welding gun. Participants and instructors received real-time feedback from the simulation software.

### | Seven grantees provided job search services.

A variety of staff provided job search services, including instructors, dedicated career coaches, job placement specialists, and career developers. For example:

- In ***Cincinnati State Technical and Community College's*** forklift program, **job placement specialists** brought employers on-site to conduct mock interviews with participants and offer job search advice. These employers would use the time on-site to determine which participants they wanted to hire. Participants who were not hired in an employer's on-site interview worked with the job placement specialist to refine their resume and submit additional job applications.
- At ***Bossier Parish Community College***, a grant-funded **career coach** helped participants develop their resumes and prepare for interviews. The career coach also provided career preparation support services by teaching participants employability skills and offering personal branding workshops. The workshops focused on helping program participants learn how to market themselves as they entered the job market.
- At ***Delgado Community College***, a **career developer** managed relationships with employers, connecting participants to employment and interview opportunities. The developer helped participants with their resumes, interviewing skills, and job search strategies. The grantee also implemented **job readiness workshops**, both in-class and standalone, that covered topics such as professional skills, job search strategies, teamwork, and conflict resolution.

### | Internships were the most common work-based learning activities among grantees.

Three grantees offered internship opportunities of varying length and formality. For example:

- The ***Manchester Community College consortium's*** advanced manufacturing program included a combination of lecture courses, lab work, and a paid internship. Participants had to interview for internships, but program staff provided assistance identifying potential employers. At Manchester Community College, participants were required to spend the last eight weeks of their advanced manufacturing program in a **paid internship**. According to grant staff, the internship often translated into a full-time job. At Naugatuck Valley Community College, participants participated in paid internships that were eight weeks long, two days a week. Participants were required to have a recommendation from their full-time instructor and good attendance in order to qualify. Around 85 percent of interns transitioned to a full-time job with that company. Before the internship period, the college alerted all companies on its list, asking those that had a need for an intern to respond.

One grantee used clinical placements to help program participants learn and further hone skills:

- In the *Washburn University consortium*, practical nursing participants at Washburn Institute of Technology attended **rotations** at several major local health care providers. The rotations showed participants the types of institutions where they could seek jobs, including a hospital, a nursing home, and a rehabilitation center. In the college's emergency medical technician program, participants were required to log 20 **clinical hours**—12 hours in an emergency room department and eight in ambulance ride-alongs.

A few grantees used grant funds to plan and develop apprenticeship opportunities. For example:

- At *Bossier Parish Community College*, a grant-funded **apprenticeship coordinator** was responsible for identifying and developing apprenticeship opportunities with employers that might benefit from apprenticeship and learning about DOL's Registered Apprenticeship College Consortium. The coordinator's goal was for the college to become a Registered Apprenticeship sponsor. As of the research team's site visit, the college had engaged in serious conversations with two employers about offering Registered Apprenticeships.

## 4. Characteristics of Participants at Program Entry, Training Duration and Service Receipt, and Participant Outcomes a Year Later

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This chapter presents characteristics of and outcomes for all participants who were enrolled in the 34 programs included in the outcomes study. The chapter first describes the socioeconomic status, demographics, and educational and career aspirations of study participants at program entry. It then describes training duration and participants' service receipt in each service area (accelerated and enhanced learning, persistence and completion, and connections to employment).

Finally, the chapter describes a number of Theory of Change "intermediate outcomes" measured about 15 months after program entry. Those intermediate outcomes are related to training progress, employment, earnings, and public assistance receipt. (Outcomes for subgroups are presented in Chapter 5.)<sup>32</sup>

The chapter addresses outcomes study research questions 1 through 5:

*What were the characteristics of study participants?*

*In which features of training programs and services did study participants engage? What college and partner (e.g., workforce agency) services did they receive? What were their assessments of the services they received?*

*What education outcomes did study participants in short-term training programs achieve? Did they see themselves on a career pathway? What were their plans for future training? What was the expected timeline?*

*Did participants obtain employment? If so, was this employment in the occupation for which they trained? What were their earnings? How did it compare to their earnings prior to entering their training programs? What were the characteristics of their jobs?*

*Did household income change? Did study participants receive public assistance benefits less frequently at follow-up than at program entry?*

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<sup>32</sup> Detailed tables underlying the figures presented in this chapter are available in Appendix G.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

### Key Takeaways: Characteristics of Participants at Program Entry

- The study participants were mostly male, mostly never married, and diverse in terms of race/ethnicity and age. Most participants (53 percent) had at least some postsecondary education at program entry.
- The share of participants receiving public assistance was low: 10 percent or less.

### Key Takeaways: Outcomes a Year after Program Entry

- Participants were generally satisfied with the grant-funded services they received.
- The majority of participants reported they completed their training programs. A majority planned to return to college.
- The vast majority of participants no longer enrolled in training at follow-up had been employed since exiting their program. Nearly half (44 percent) of program completers were employed in jobs related to their training.
- Average quarterly earnings increased by \$2,272 from three quarters before program entry to five quarters after program entry.
- A majority of participants who were no longer enrolled in their programs were employed full-time in positions with benefits.
- Greater percentages of program completers than non-completers were employed in jobs related to their programs and in those with benefits.
- Participants' household income increased and the percentage living in poverty decreased.
- Participants' receipt of public assistance benefits remained stable.

### 4.1. CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY

The participants in the 34 programs studied were diverse in terms of demographic, socioeconomic, and economic characteristics. They also had varying educational and employment histories. This section describes the characteristics of the participants based on the data captured in the Baseline Information Form.

**Most participants were male and most were single, but they were otherwise diverse demographically.**

Eighty-five (85) percent of participants were male, reflecting the large share of programs in the manufacturing sector, jobs that have traditionally been occupied by men.<sup>33</sup> Several colleges that offered manufacturing programs (e.g., Chaffey College, Manchester Community College, South Central College) intended to recruit women. However, staff reported difficulty recruiting women despite outreach efforts.

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<sup>33</sup> See, for example: <https://www.census.gov/newsroom/blogs/random-samplings/2017/10/women-manufacturing.html> (last accessed 15 June 2020).

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

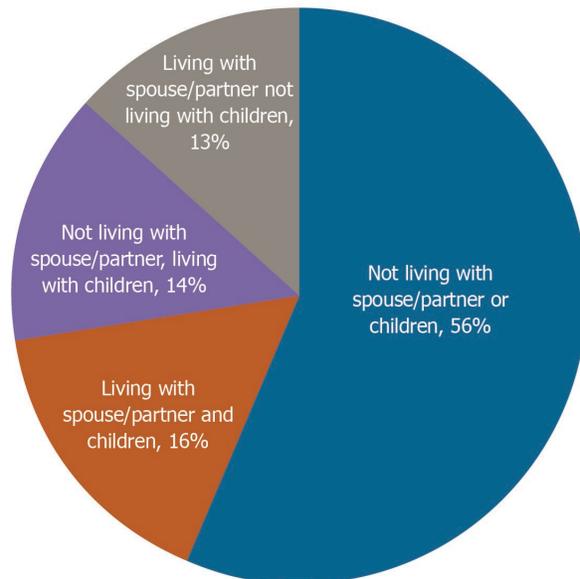
The majority of participants were single. As **Exhibit 4-1** shows, 56 percent were not living with a spouse or partner, nor did they live with children. Twenty-nine (29) percent lived with a spouse or partner (either with or without children). The remainder lived with children but not a spouse or partner.

Nearly one-third (29 percent) of participants lived rent-free at program entry. Fifty-three (53) percent rented their own place or contributed to rent at a friend or family member's place while 18 percent owned the place where they lived (not shown).

Participants were diverse in terms of other demographic characteristics. Forty (40) percent were traditional college age—that is, 24 years or younger (**Exhibit 4-2**). Those older than traditional college students were almost evenly split between ages 25 to 34 and 35 or older.

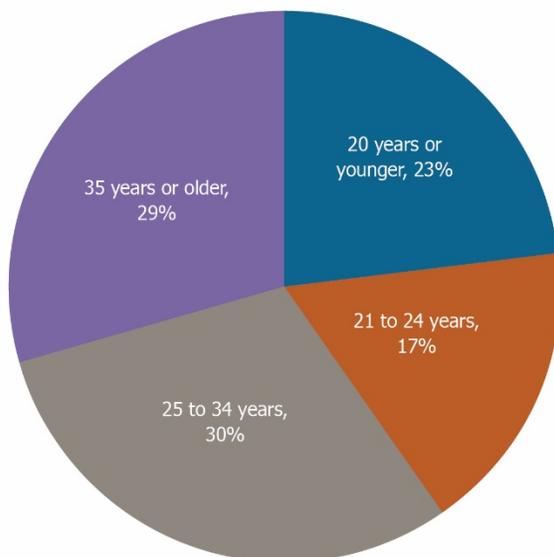
Participants were racially and ethnically diverse, as well. Almost half (48 percent) were white (non-Hispanic), and more than one fifth each were Hispanic (any race) and black (non-Hispanic) (**Exhibit 4-3**). Four percent of participants were Asian (non-Hispanic).

**Exhibit 4-1. Participants' Family Structure at Program Entry**



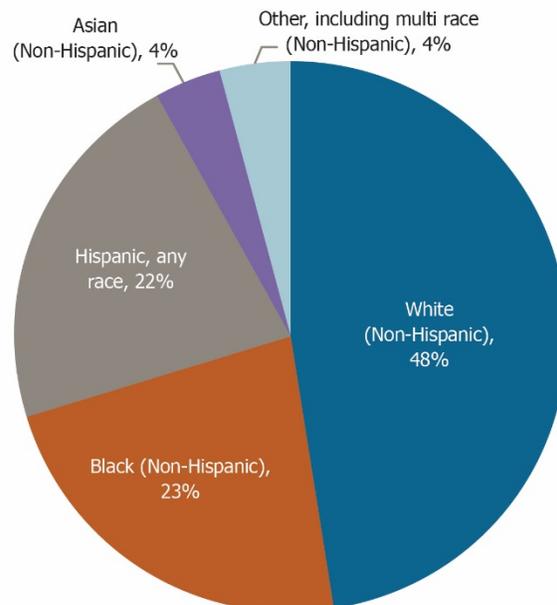
Source: Baseline Information Form  
Note: Sample includes all study participants ( $N = 2,767$ ).

**Exhibit 4-2. Age at Program Entry**



Source: Baseline Information Form  
Note: Sample includes all study participants ( $N = 2,767$ )

**Exhibit 4-3. Race and Ethnicity**



Source: Baseline Information Form  
Note: Sample includes all study participants ( $N = 2,767$ ).

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

As **Exhibit 4-4** shows, most participants at program entry had at least some postsecondary education (53 percent), most commonly some college but no degree (32 percent). The largest share of participants (43 percent) had a high school diploma or GED. Few participants were at either end of the education spectrum: 4 percent had less than high school and 8 percent had a bachelor's degree or more.

**The majority of participants were working at program entry or had worked within the past year.**

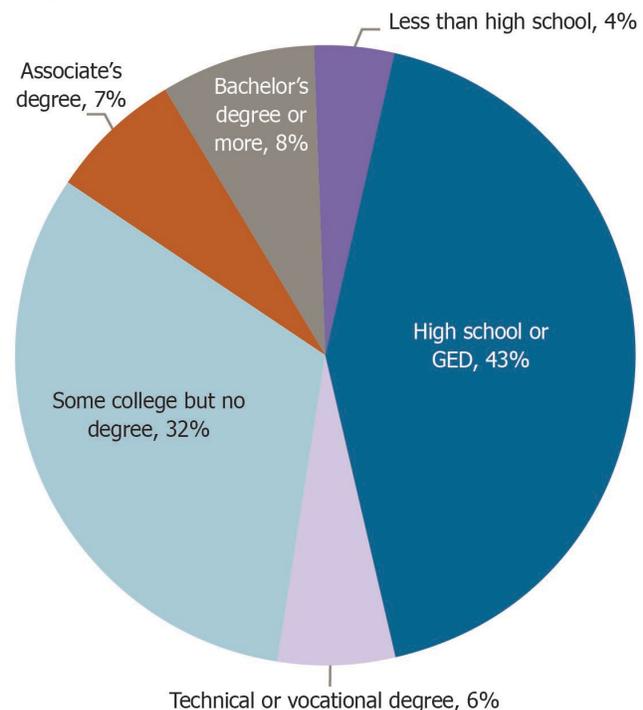
As **Exhibit 4-5** shows, more than half (56 percent) of participants were employed at program entry. Thirty (30) percent were not working at the time but had worked within the previous 12 months. Less than 15 percent were long-term unemployed or had never worked.

A larger share of participants—77 percent—expected to work in the months following program entry, either full time (47 percent) or part-time (30 percent). About one fifth did not plan to work any hours.

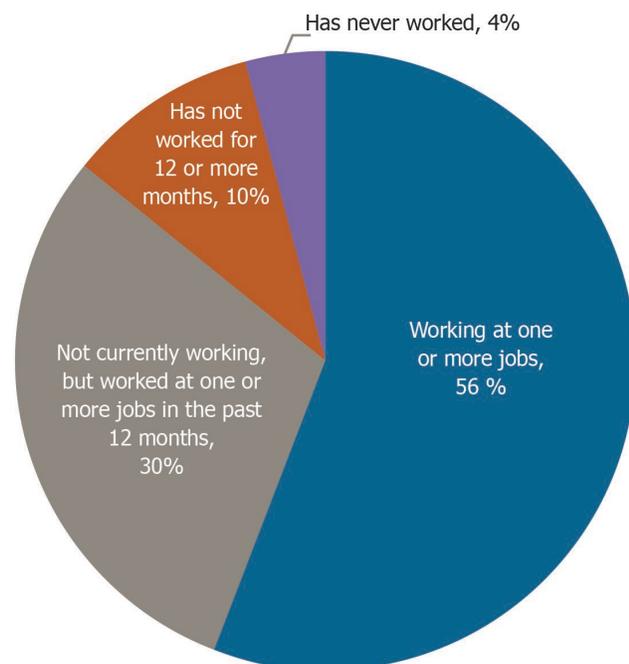
**Manufacturing was the most common industry reported by participants employed at program entry and by those unemployed but with recent work experience.**

As shown in **Exhibit 4-6**, similar proportions of participants employed at program entry and those unemployed but with work experience reported employment in manufacturing (18 percent and 17 percent, respectively). Beyond manufacturing, industry differed by employment status. Employed participants reported the next most common industries were retail trade (15 percent), accommodation/food service (11 percent)

**Exhibit 4-4. Educational Attainment at Program Entry**



**Exhibit 4-5. Employment Status at Program Entry**

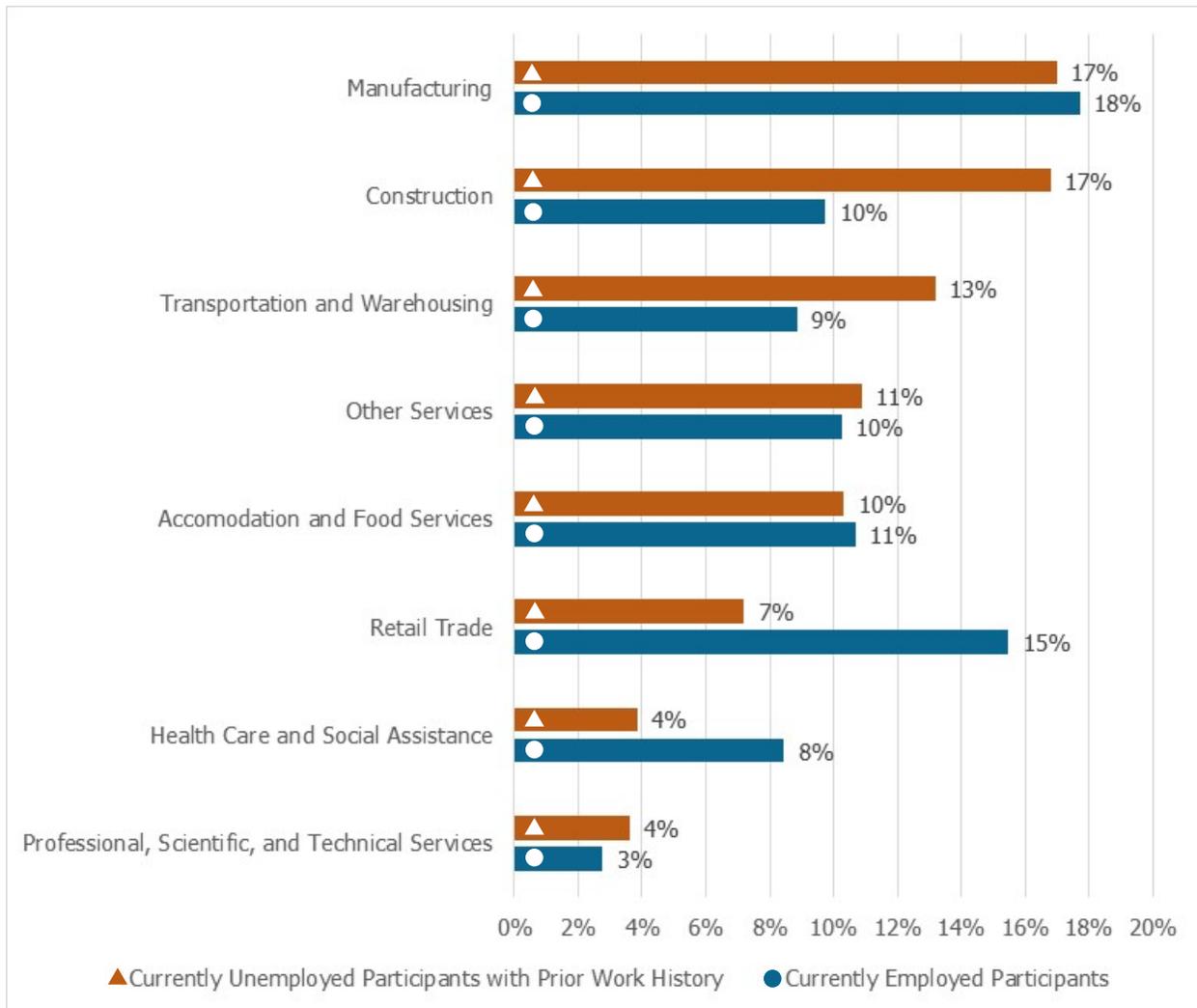


Source: Baseline Information Form  
Note: Sample includes all study participants ( $N = 2,767$ )

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

construction (10 percent), and other services (10 percent). Unemployed participants with work experience reported the next most common previous industries were construction (17 percent) and transportation/warehousing (13 percent).

**Exhibit 4-6. Prior Industry of Participants by Employment Status at Program Entry**



Source: Baseline Information Form

Note: Sample in the analysis includes participants employed at enrollment ( $N = 1,563$ ) and unemployed participants with prior work history at enrollment ( $N = 827$ ). Participants with no prior work history are excluded, as are participants with rare industry backgrounds.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

The average hourly wage for participants employed at program entry was \$14.09, lower than the last hourly wage among those unemployed at program entry (\$14.55) (not shown). This difference may reflect differences in industry types. As noted above, beyond manufacturing, currently employed participants reported retail and accommodation/food services as common industries, whereas unemployed participants with work experience reported construction and transportation/warehousing, industries that generally pay higher wages.<sup>34</sup>

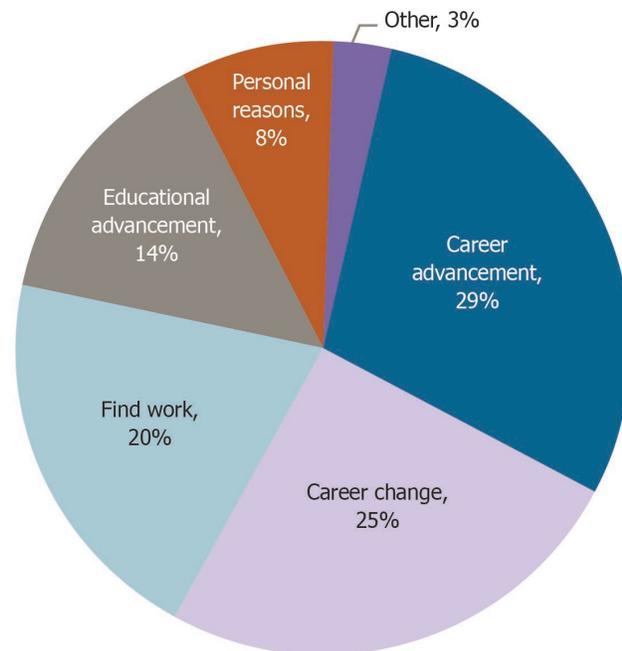
**Exhibit 4-7** shows which reason participants reported as “most important” for enrolling in their training programs. The most common reason cited was career advancement (29 percent), followed by career change (25 percent). One fifth cited finding work as their reason.

The majority of participants had no prior experience in the target industry (60 percent) (not shown). About one third reported a year or more of experience in the target industry; the remainder had less than a year of experience.

**Most participants were low income but few received public assistance benefits.**

Thirty (30) percent of participants reported their family income was less than \$15,000 the year prior to program entry, and slightly fewer (27 percent) reported income between \$15,000 and \$29,999 (not shown). The average family income was \$33,526. Nearly 43 percent of participants had family incomes below the poverty level.<sup>35</sup>

**Exhibit 4-7. “Most Important” Motive for Enrollment**



Source: Baseline Information Form

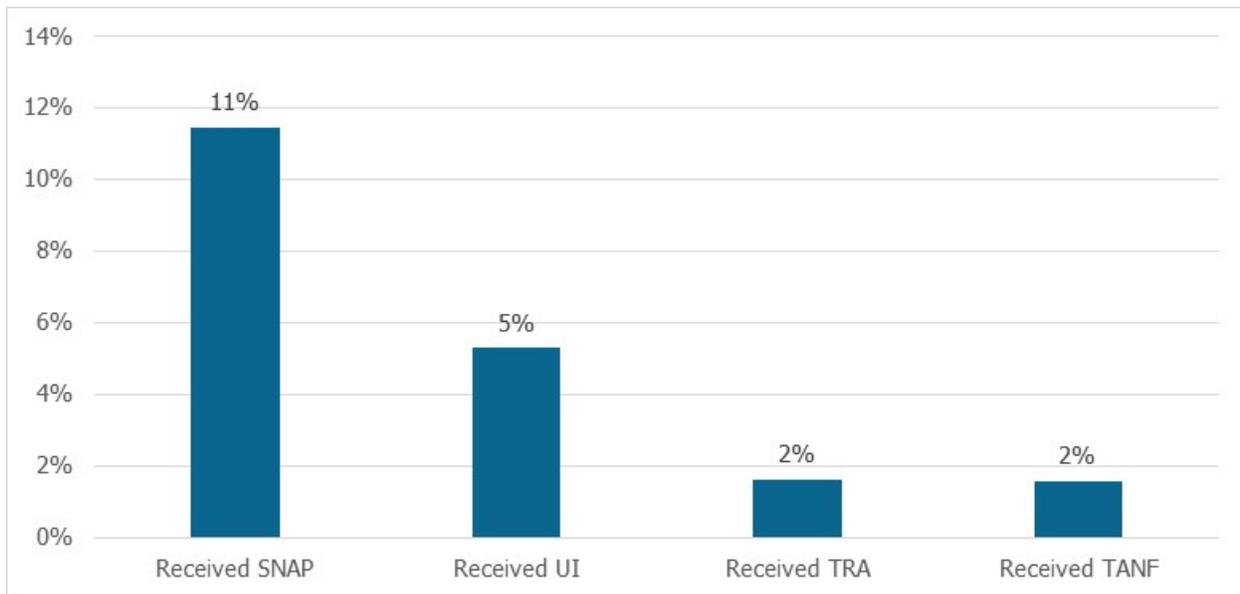
As **Exhibit 4-8** shows, few participants reported receiving public assistance at program entry. The most common benefit reported was SNAP (11 percent of participants). Very few participants received Trade Readjustment Allowances (TRA) or TANF (2 percent each).

<sup>34</sup> The May 2019 U.S. Bureau of Labor Statistics occupational and employment statistics report that the mean hourly wage is \$20.06 for construction laborers and \$18.23 for the transportation and moving materials industry. In contrast, the mean hourly wage is \$13.27 for retail sales workers and \$12.82 for food preparation and serving related occupations ([https://www.bls.gov/oes/current/oes\\_nat.htm#35-0000](https://www.bls.gov/oes/current/oes_nat.htm#35-0000)).

<sup>35</sup> Poverty status was calculated from reported family income and family size, using 2017 federal poverty guidelines (<https://aspe.hhs.gov/2017-poverty-guidelines>). For example, the poverty level for a family of three was \$20,420.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

**Exhibit 4-8. Public Assistance Benefit Receipt at Program Entry**



Source: Baseline Information Form

Note: Sample includes all study participants ( $N = 2,767$ ).

### 4.2. TRAINING DURATION

All study participants received some training due to the timing of study enrollment, which occurred on the first day of class or shortly thereafter. This section reports the months of training, full-time-equivalent (FTE) months of training, and completion of at least six FTE months of training. **Exhibit 4-9** shows the average values, both in total and by completion status. On average, participants studied for 7.4 months. However, they were not all full-time students. Treating 12 hours per week in class as full-time, the average number of FTE months of training was 6.2.<sup>36</sup>

A recent evaluation of a grant-funded short-term health care training programs found that the programs succeeded at increasing credential receipt among study participants who could access the programs but that credential receipt had not translated into detectable earnings impacts three years post study entry (Peck et al. 2019). Most of the credentials earned required a few months of study. The evaluation team speculated that persisting through at least six months of study might be more likely to lead to higher earnings and therefore declared six months of training to be a threshold of interest for this study of TAACCCT.<sup>37</sup> Forty-four percent of the full sample reached or exceeded this threshold.

Training duration was naturally much longer for participants still enrolled in their original program at follow-up a year after program entry. Among these participants, the average number of enrolled months was 14.0, the average number of FTE months was 10.7, and 83 percent reached the threshold of six FTE

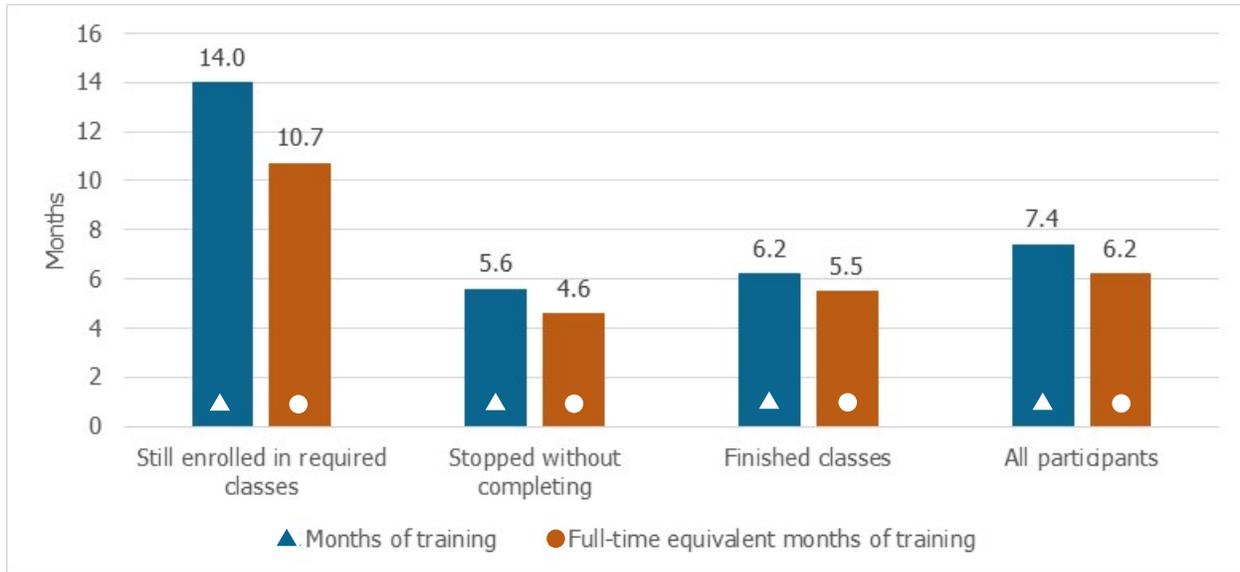
<sup>36</sup> The assumption here is that there are two hours of class preparation for every hour in class, so 12 hours per week in class translates of 36 hours of study per week.

<sup>37</sup> This decision was also made for a parallel evaluation of health care training programs (Judkins, Klerman and Locke 2020). Even this might not be a high enough threshold since Dadgar and Trimble (2015) found that short-term credentials (those that require less than a year of study) do not increase the earnings of people who receive them, but it does seem credible that 6 months of training are more likely to result in earnings growth than just a handful of months.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

months. For those who finished the program or who stopped attending without finishing at follow-up, the duration of training was much shorter. Finishers studied 6.2 months overall and 5.5 FTE months; 39 percent achieved the six FTE month threshold.

**Exhibit 4-9. Training Duration**



Source: Short-term participant follow-up survey

Note: Sample includes all survey respondents ( $N = 2,211$ ).

### 4.3. SERVICE RECEIPT

In addition to classroom training, grantees provided an array of supplemental services to support participant completion of training. These include services that accelerate or enhance learning, support persistence and completion, and/or provide connections to employment with the aim of improving education and employment outcomes for participants. This section focuses on select academic and nonacademic supports and services provided by grantees, as reported by participants on the short-term follow-up survey. The services included in this section are not exhaustive of all services that participants may have received or grantee colleges may have offered. Rather, services included are those highlighted in the TAACCCT theory of change presented in Chapter 2 and could be self-reported by participants.

**Most participants reported their program was part of a career pathway; a minority reported engagement in other accelerated and enhanced learning strategies.**

The most common accelerated and enhanced learning strategies reported include career pathways that guide advancement to subsequent programs and credentials, transfer credits, and credits for prior learning. Sixty-nine (69) percent of participants reported there was a recommended program that led to a more advanced credential (not shown). This finding aligns with the implementation study; all nine outcomes study grantees reported that they were implementing new or enhancing existing career pathways programs.

Although most grantees in the study awarded credit for prior learning, only 4 percent of participants reported receipt of such credit, and the average number of credits received was one. A possible factor is

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

the predominance of manufacturing programs in the study. The most common methods of assessing prior learning are review of a portfolio of work or a skills test. Advanced manufacturing does not lend itself to portfolio review because participants cannot assemble examples of their work. And, according to program staff, there is no standard skills assessment for advanced manufacturing.

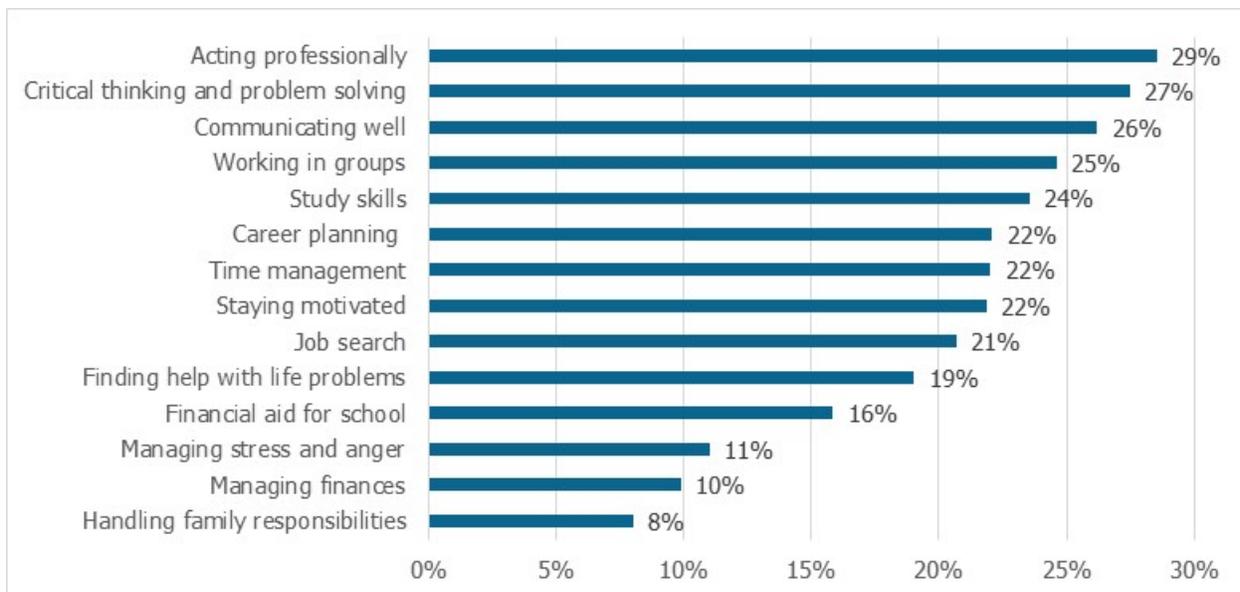
About one fifth of the sample (21 percent) received transfer credits; among those who received them, the average was six credits (not shown).

**Persistence and completion strategies reported included a range of academic and nonacademic supports, most commonly academic advising. Many reported taking classes in other skills, with varying topics.**

Nearly half of participants (47 percent) received academic advising (not shown). This may reflect the intensive advising designed and implemented by several grantees, including Delgado Community College's navigation feature<sup>38</sup> and South Central College's intrusive advising.<sup>39</sup>

As **Exhibit 4-10** shows, the most commonly reported persistence and completion strategies not related to advising were providing opportunities for participants to learn other skills: acting professionally (29 percent), critical thinking and problem solving (27 percent), communicating well (26 percent), and working in groups (25 percent). The least common persistence and completion strategies received included classes on handling parenting and other family responsibilities (8 percent) and managing finances (10 percent).

**Exhibit 4-10. Topics Covered in Classes that Taught Skills Other than Occupational Skills**



Source: Short-term participant follow-up survey  
Note: Sample includes all survey respondents ( $N = 2,211$ ).

<sup>38</sup> At Delgado Community College, two program navigators provided participants with intensive case management, developed individual service strategies, and acted as a resource to promote retention and completion.

<sup>39</sup> Intrusive advising included working with participants to detect and resolve persistence issues by monitoring their attendance, speaking with instructors, and interpreting the results of academic assessments.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Nearly one third of participants received financial aid advising to help them to persist in and complete their program. The most common source of funding for training was the participant's own earnings or those of a spouse.

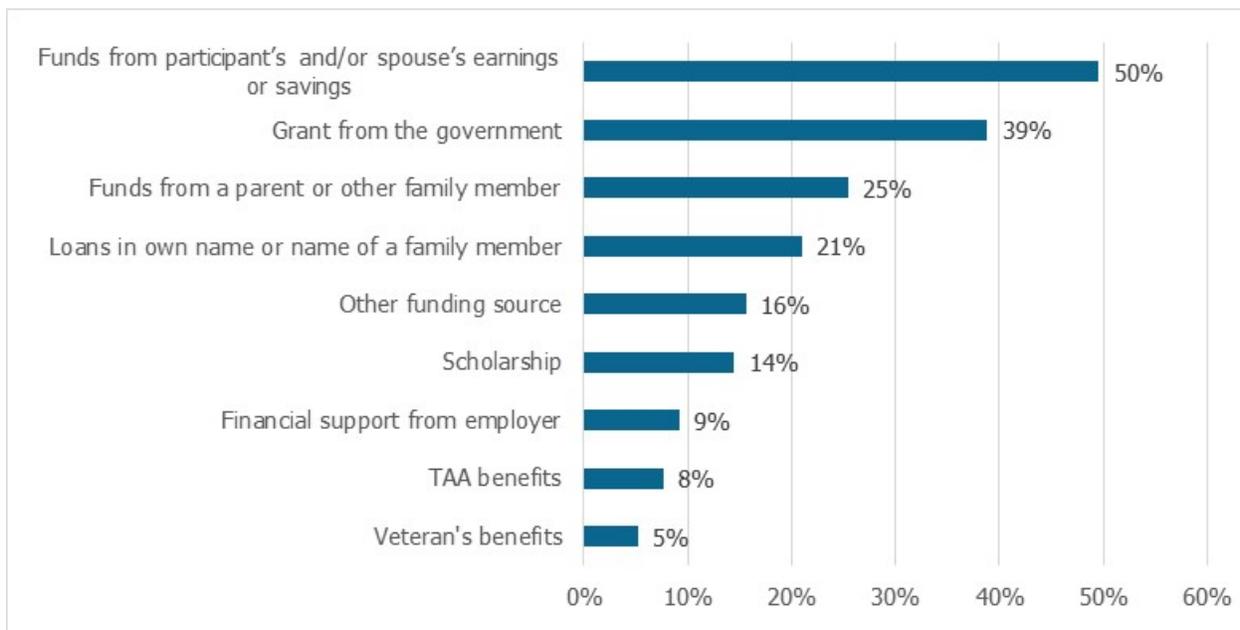
Almost a third of participants (31 percent) received financial aid advising (not shown). Several colleges, including colleges in the Chaffey College and South Central College consortiums, provided referrals to financial aid advising.

As **Exhibit 4-11** shows, half of participants (50 percent) funded their training at least partially with their own savings or those of a spouse. The average amount of funds used was \$2,335 among those using any of their own funds. This varied by enrollment status, with those still enrolled at the time of follow-up reporting more funds used (\$2,928) than those who completed their program (\$2,334) (not shown). This could reflect that participants still enrolled were in longer-term and more expensive programs, such as associate's degrees. Those who left their program before completion reported spending an average of \$1,748.

A quarter of participants received financial assistance from a parent or other family member. Loans were slightly less common (21 percent); among those who took out loans, the average amount borrowed was \$3,837 (not shown). Currently enrolled participants and those who completed reported similar amounts of borrowed funds (about \$4,000), while those who left their program prior to completion reported \$3,114 in loans.

Almost 40 percent received grants from the government such as Pell grants. Few used veterans' benefits (5 percent) or TRA benefits (8 percent) to fund training or received assistance from their employers (9 percent).

**Exhibit 4-11. Sources of Financial Assistance for Training Programs**



Source: Short-term participant follow-up survey  
Note: Sample includes all survey respondents ( $N = 2,211$ ).

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Large percentages of participants engaged in connections to employment strategies, most commonly work simulations.

As shown in **Exhibit 4-12**, more than 80 percent of participants reported engaging in work simulations. This reflects the large grant-funded simulation centers (the Chaffey College consortium’s InTech Center and the Washburn University consortium’s Sim Center at Washburn Institute of Technology) as well as the numerous information technology, welding, machining, construction, and other labs funded or enhanced with the TAACCCT grant. About half of participants (48 percent) reported engaging in computer or other simulations where they practiced skills in virtual settings.

Fifty-one (51) percent of participants reported arranged visits from or to employers to learn about their work and types of jobs available. More than one third (35 percent) attended classes taught by instructors from a local employer or classes offered on-site at a local employer.

Additionally, 57 percent of participants reported some type of direct work experience as part of their program (not shown).<sup>40</sup> The most common type of work study was a work study job (27 percent), followed by an internship (25 percent) and an apprenticeship (22 percent). Almost 30 percent reported participation in some other type of work study.

**Exhibit 4-12. Participation in Various Types of Work-based Learning Experience**



Source: Short-term participant follow-up survey  
Note: Sample includes all survey respondents ( $N = 2,211$ ).

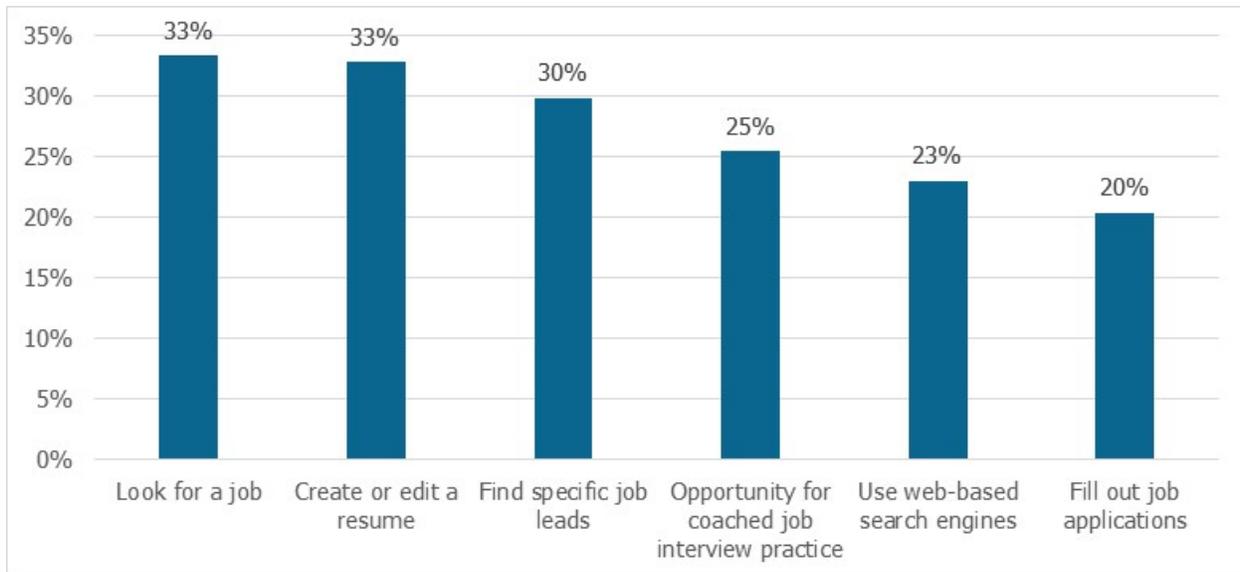
<sup>40</sup> Participants were asked, “As part of your studies for [PROGRAM NAME] at [SCHOOL NAME], have you been offered any of the following opportunities for direct experiences with occupations related to your studies or career goals?” They were then presented with each of the opportunities presented in Exhibit 4-12. Fifty-seven (57) percent reported that they received direct work experience, either as a work study job, internship, apprenticeship, clinical experience or practicum, or other work experience.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

About 40 percent of participants received job search or placement assistance.

Forty (40) percent of participants received job search or placement assistance. As shown in **Exhibit 4-13**, the most common types of assistance received were help looking for a job (33 percent), help creating or editing a resume (33 percent), and help finding specific job leads (30 percent). These were the types of services implemented by grant-funded career coaches at Bossier Parish Community College, job placement specialists at Cincinnati State Technical and Community College, career developers at Delgado Community College, and other staff at the grantees.

**Exhibit 4-13. Receipt of Various Types of Job Search and Placement Assistance Services**



Source: Short-term participant follow-up survey

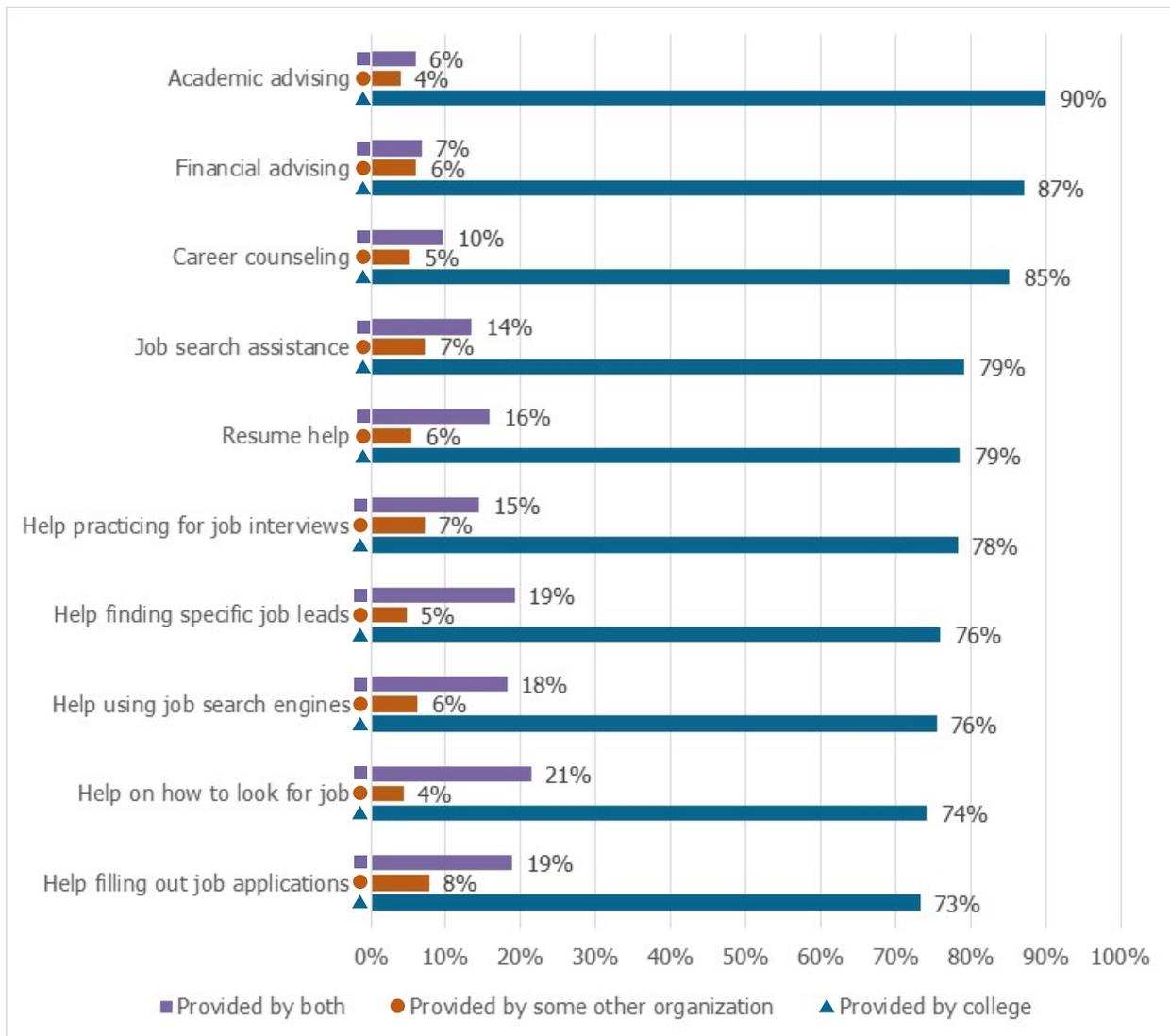
Note: Sample includes all survey respondents ( $N = 2,211$ ).

Nearly all participants who received advising and employment services did so from colleges rather than partners.

**Exhibit 4-14** summarizes which organizations provided various services to participants. Among participants who received academic advising, 90 percent reported they received it only from the college. Eighty-seven (87) percent of participants who received financial advising and 85 percent who received career counseling received those services only from the college. Some participants said they received services from both the college and another organization. For example, 74 percent of participants reported receiving help on how to look for a job only from the college, 21 percent reported they received such help from the college plus another organization, and 4 percent from only another organization.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

**Exhibit 4-14. Organization Providing Services**



Source: Short-term participant follow-up survey

Note: Among those receiving each service, N varies by row.

**More than half of participants were highly satisfied with the grant-funded services they received.**

Nearly 60 percent were very satisfied with the training and services they received, and 33 percent reported being somewhat satisfied (not shown). A small minority (7 percent) were not satisfied. These figures include those still in training as of the survey.

# CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

## 4.4. OUTCOMES RELATED TO TRAINING PROGRESS

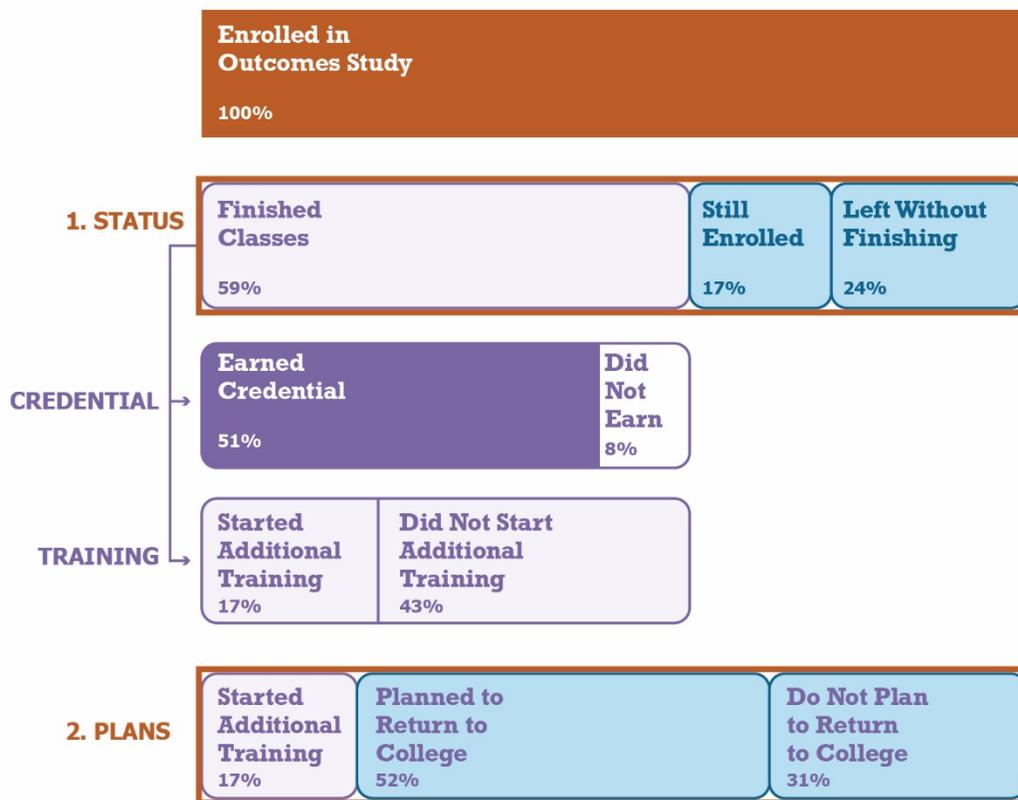
The section presents outcomes related to participants' training progress, including completing programs and continuing to additional training.

Most participants completed their training program by the time they responded to the survey, about 15 months after program entry.

Fifty-nine (59) percent of participants reported finishing the classes for their grant-funded program, and 51 percent also received an associated credential (**Exhibit 4-15**); thus, for the purposes of this report, 51 percent of participants completed their program. Nearly 17 percent of participants reported that they had finished classes for the program, received an associated credential, and started an additional training program.

Almost a quarter (24 percent) left their program without finishing the required classes. Seventeen (17) percent were still enrolled in their program at the time of the follow-up survey approximately 15 months after program entry.

**Exhibit 4-15. Training Outcomes at 15 months**



Source: Short-term participant follow-up survey

Note: Sample includes all survey respondents ( $N = 2,211$ ). Components may not sum to totals due to rounding.

Median lag from program entry to interview was 14.8 months, with 90 percent of interviews occurring between 12 and 18 months after program entry.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

### | More than half of participants planned to return to college.

Fifty-two (52) percent of participants reported that they planned to return to college at some time in the future. Among all participants who planned to return, the average number of months until they expected to re-enroll was eight.

### | About one third of participants earned college credits.

Thirty-two (32) percent of participants reported they earned college credits from participating in their program (not shown). Of those who earned credits, the average number of credits earned was 16.

## 4.5. OUTCOMES RELATED TO EMPLOYMENT, EARNINGS, INCOME, AND RECEIPT OF PUBLIC ASSISTANCE

This section presents participants' outcomes related to employment, earnings, and income about 15 months after program entry. It first discusses changes in their earnings and employment status over time. It then examines whether participants were working after exiting their program, and if so, the nature of their jobs (i.e., whether the job was closely related to the industry of their training program and whether it provided employee benefits). The chapter concludes by examining changes in study participants' household income and receipt of public assistance benefits over the period between program entry and the short-term participant follow-up survey.

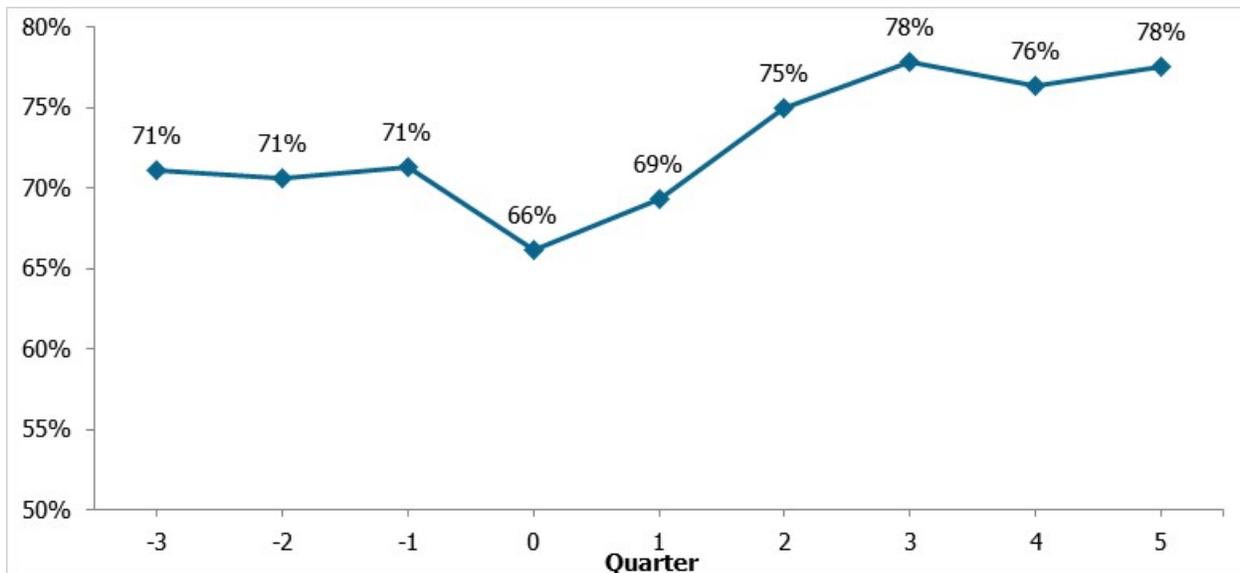
Because this follow-up period is relatively short, caution should be used in interpreting the findings. It is likely that the follow-up period was too short to capture some credential awards and earnings as well as reductions in public assistance benefit receipt. In particular, given that 17 percent of the sample was still enrolled in their programs at the time of survey follow-up, not all outcomes are post-training outcomes. As noted below, participants still enrolled in training were excluded from some analyses.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Rates of employment increased from the quarters just before program entry to five quarters after entry.

According to NDNH data (which measures whether participants had any employment earnings during the quarter), participants' employment rate over the three quarters prior to program entry was about 71 percent, but then decreased in the quarter of program entry (Q0) to 66 percent. Then starting in Q1, their employment rate increased, mostly continuing to do so for the next four quarters. As **Exhibit 4-16** shows, by the fifth quarter after program entry (Q5), 78 percent of participants were employed, an increase of 12 percentage points since Q0 and 7 percentage points relative to the period before program entry.<sup>41</sup> Twenty-two percent were not employed in the fifth quarter (i.e., had no employment earnings). Although employment continued to increase throughout the follow-up period (through Q5), a majority of participants were employed during each quarter, and thus combined work and training.

**Exhibit 4-16. Average Employment by Quarter from Three Quarters Prior to the Quarter of Program Entry to Eight Quarters Later**



Source: National Directory of New Hires

Note: Sample includes all participants with valid SSN ( $N = 2,355$ ).

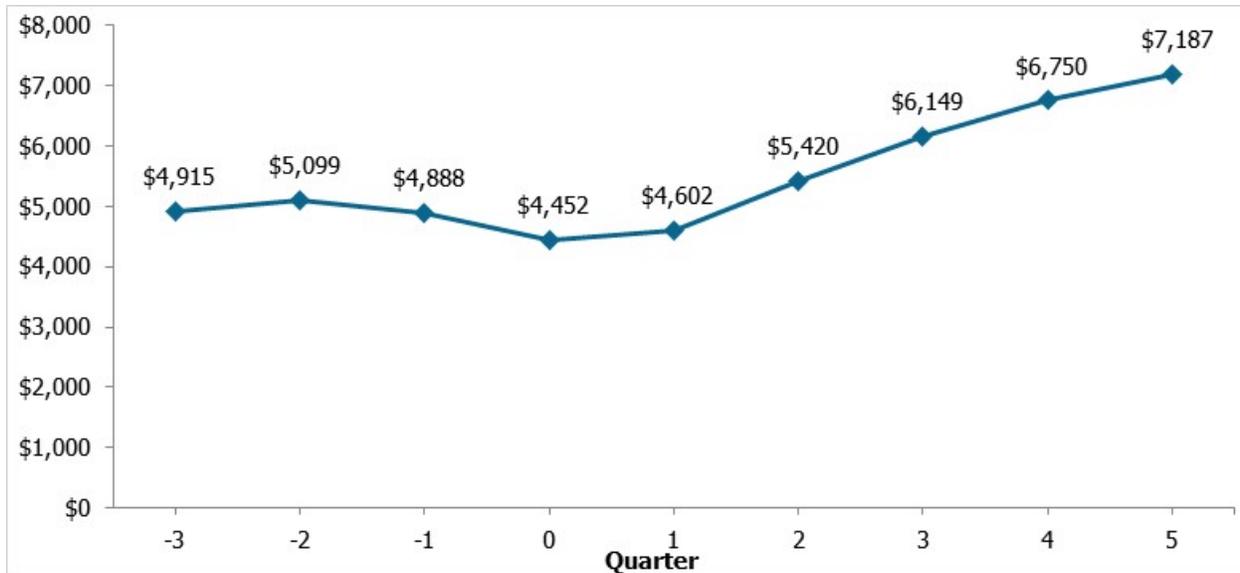
<sup>41</sup> The employment rates generated from the follow-up participant survey data are different from those produced from the NDNH data. This is because the two data sources have different samples. In the follow-up survey, only participants who were no longer enrolled in their program were asked whether they were currently employed ( $N=1,835$ ). The NDNH sample includes all participants who had provided their SSN, regardless of whether they were still enrolled in training ( $N=2,355$ ).

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Average quarterly earnings increased by \$2,272 between Q(-3) and Q5.

The research team compared participants' average quarterly earnings three quarters prior to program entry to their average quarterly earnings five quarters after program entry.<sup>42</sup> NDNH data shows average earnings dropped in the quarter of program entry (Q0) and then began to rise each quarter thereafter (**Exhibit 4-17**). By the fifth quarter following program entry, average quarterly earnings were \$7,187, an increase of \$2,272 (or 46 percent) from three quarters prior to program entry.

**Exhibit 4-17. Average Quarterly Earnings from Three Quarters Prior to the Quarter of Program Entry to Eight Quarters Later**



Source: National Directory of New Hires

Note: Sample includes all participants with valid SSN ( $N = 2,355$ ). Participants with zero earnings included.

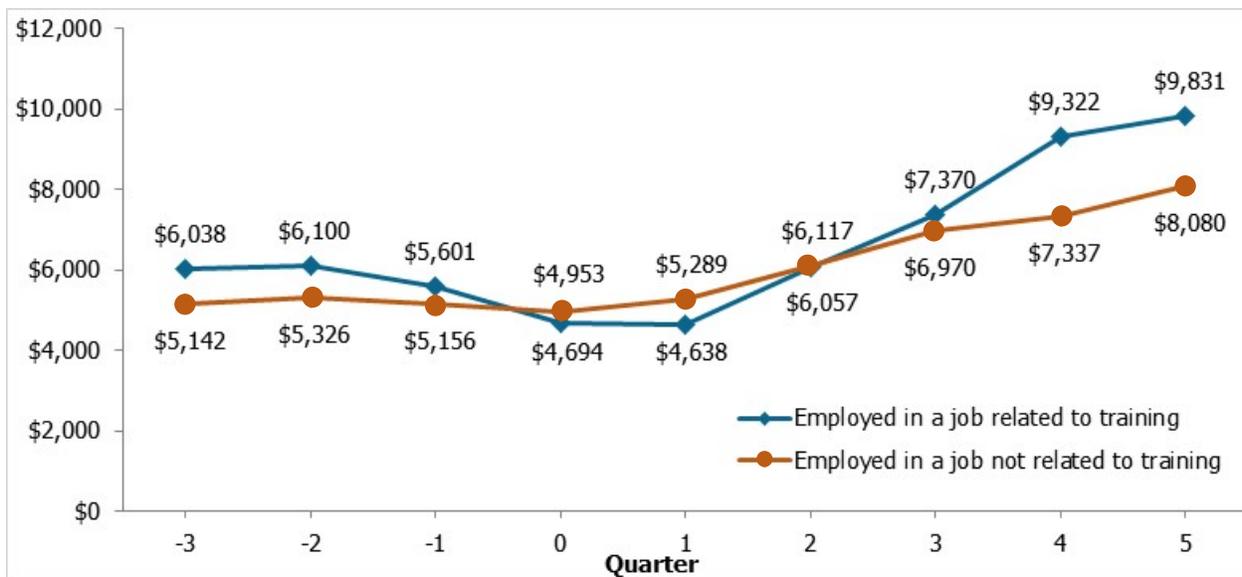
<sup>42</sup> Unemployed persons are included in these analyses. Any quarter in which a participant had zero earnings is included.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Participants who were employed in a job related to training had larger earnings increases than those employed in a job not related to training.

**Exhibit 4-18** shows that changes in quarterly earnings differs by employment status at follow-up. Participants who were employed in job related to their training at follow-up had higher earnings in the three quarters before enrollment than those employed in a job not related to training at follow-up. They also experienced a larger decrease in earnings in the quarter of program entry. By the fifth quarter after program entry, earnings for participants employed in a job related to their training at follow-up was \$9,831, an increase of about \$3,800 (63 percent) from three quarters prior to program entry. Earnings for participants employed in a job not related to their training grew to \$8,080, an increase of about \$2,900 (57 percent) from three quarters prior to program entry.

**Exhibit 4-18. Average Quarterly Earnings, by Employment Status**



Source: National Directory of New Hires

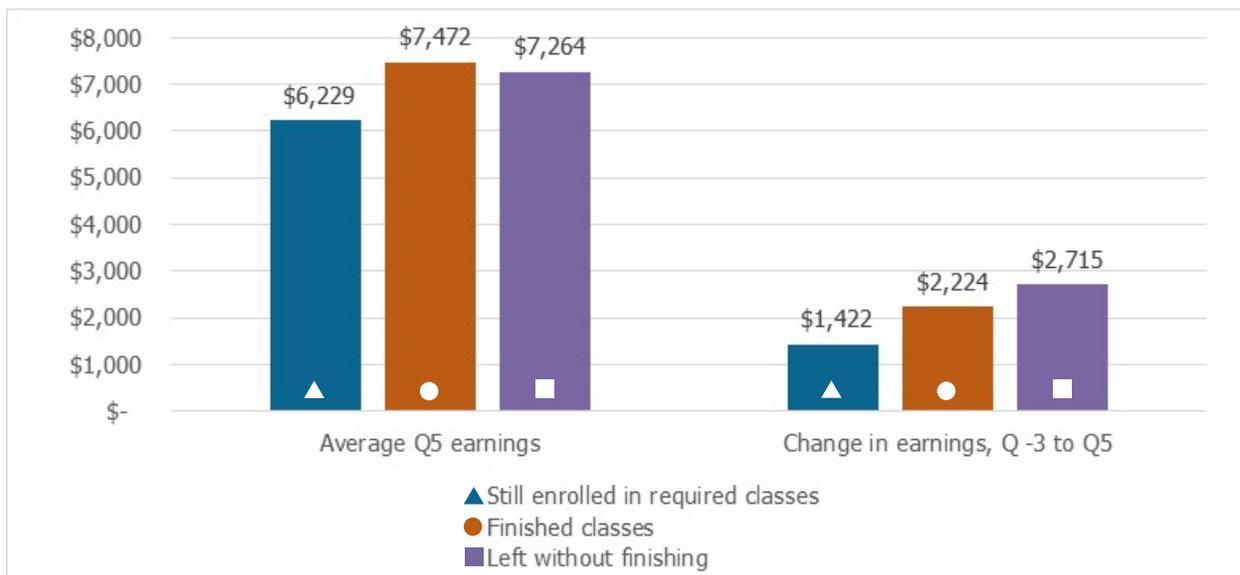
Note: Sample includes participants who reported being employed in the short-term participant follow-up survey and who provided a valid SSN. N: 459 employed in a job related to training, and 793 employed in a job not related to training.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Participants who finished their required classes had the highest average earnings five quarters after program entry. However, participants who left without finishing their classes experienced the largest earnings gains.

**Exhibit 4-19** shows average fifth quarter earnings and the change in earnings between three quarters before program entry to five quarters after program entry by enrollment status. In the fifth quarter after program entry, participants who had finished the required classes earned on average of \$208 more than those who left without finishing and \$1,243 more than those who were still enrolled in their program at the time of follow-up. Participants who left without finishing had the largest average increase in earnings, \$2,715.<sup>43</sup>

**Exhibit 4-19. Change in Quarterly Earnings by Enrollment Status**



Source: National Directory of New Hires

Note: Sample includes participants who responded to the short-term participant follow-up survey and who provided a valid SSN. N: 298 still enrolled in required classes, 1,140 finished classes, and 431 left without finishing. Median lag from program entry to interview was 14.8 months, with 90 percent of interview occurring between 12 and 18 months after program entry.

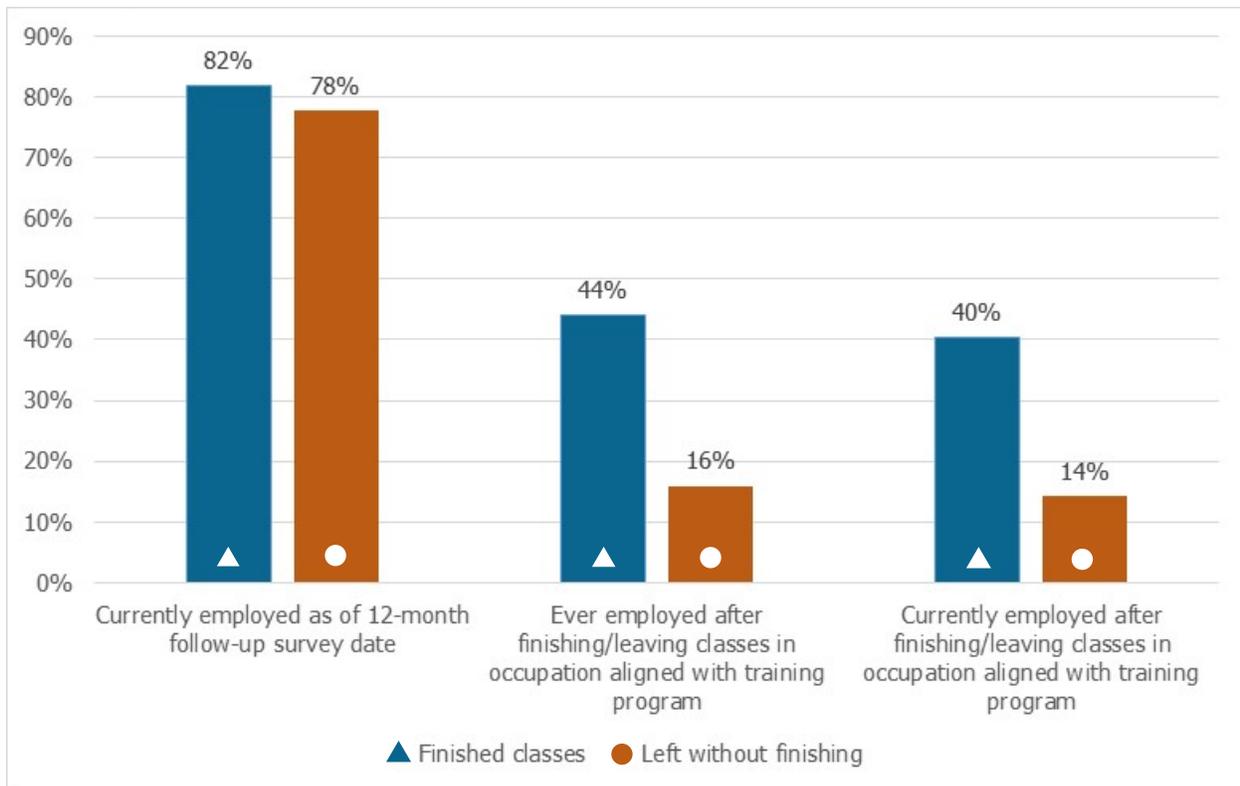
<sup>43</sup> NDNH data indicate whether an individual is employed and his or her earnings during the quarter, but it does not include information on the number of weeks in which the individual worked, the number of hours worked, or hourly wage.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Participants who finished their classes were nearly three times more likely to be employed in a job related to their training compared to participants who left without finishing

**Exhibit 4-20** presents the employment status of participants no longer enrolled in their training programs. Slightly more participants who finished classes were employed at the time of the short-term follow-up survey than were participants who left without finishing (82 percent versus 78 percent). However, a minority of each group were employed in an occupation that was closely related to their program. Still, participants who finished classes were several times more likely than those who left without finishing to report current employment in a position related to their program (40 percent versus 14 percent). A slightly larger proportion of each group reported they were ever employed in such a job (44 percent of participants who finished their classes versus 16 percent of participants who left without finishing).

**Exhibit 4-20. Employment Status and Training-related Employment, by Enrollment Status**



Source: Short-term participant follow-up survey

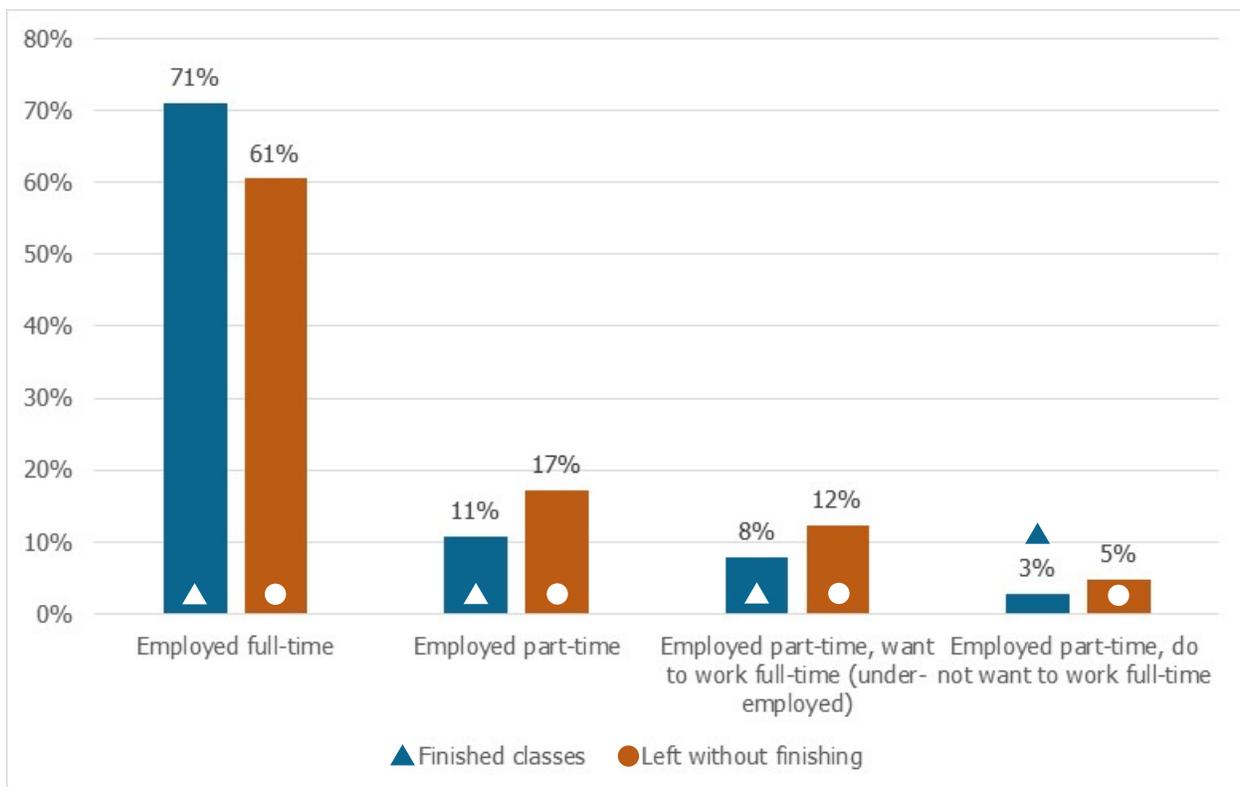
Note: Sample includes survey respondents who finished classes ( $N = 1,316$ ) or left without finishing ( $N = 519$ ). Median lag from program entry to interview was 14.8 months, with 90 percent of interview occurring between 12 and 18 months after program entry.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Most participants reported full-time employment once no longer enrolled in their program, and more participants who finished classes than those who left without finishing had jobs with benefits.

Of the participants who were no longer enrolled in their training programs, more participants who finished classes than those who left without finishing reported full-time employment (71 percent versus 61 percent) (**Exhibit 4-21**). The reverse was true of part-time jobs: 17 percent of participants who left without finishing classes and 11 percent of those who finished reported part-time employment. Moreover, larger percentages of participants who finished classes than those who left without finishing were underemployed: 12 percent of participants who finished classes and 8 percent of those who left without finishing were working part-time but wanted to work full-time.

**Exhibit 4-21. Employment Status at Survey Follow-up, by Enrollment Status**



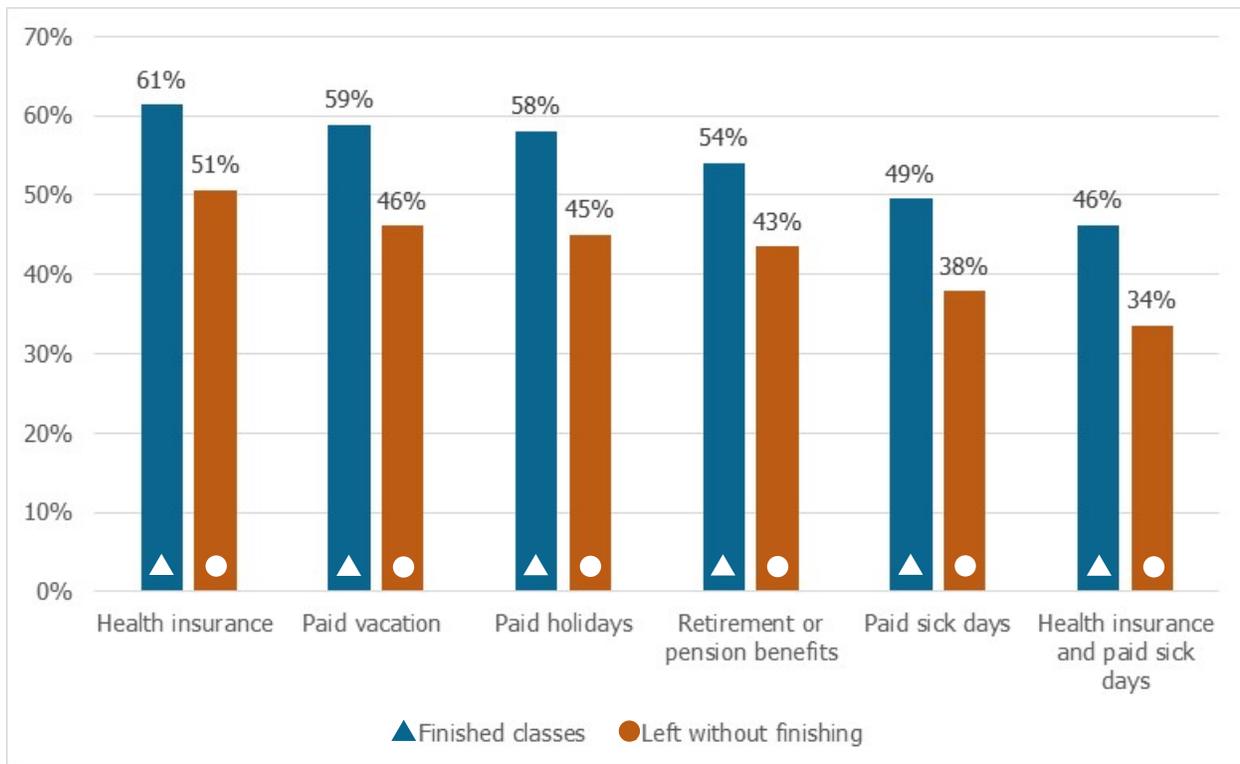
Source: Short-term participant follow-up survey

Note: Sample includes only survey respondents who finished classes ( $N = 1,316$ ) or left without finishing ( $N = 519$ ). It does not include those still in training. Median lag from program entry to interview was 14.8 months, with 90 percent of interview occurring between 12 and 18 months after program entry.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

As shown in **Exhibit 4-22**, more participants who finished classes than those who left without finishing reported employment in jobs that offered employee benefits. Sixty-one percent of participants who finished classes were in jobs that offered health insurance, compared to 51 percent of participants who left without finishing. The majority of participants who finished classes also reported their jobs offered paid vacation, paid holidays, and retirement or pension benefits, compared to 46 percent or fewer participants who left without finishing, depending on the benefit.

**Exhibit 4-22. Employed in Job with Benefits, by Enrollment Status**



Source: Short-term participant follow-up survey

Note: Sample includes survey respondents who finished classes ( $N = 1,316$ ) or left without finishing ( $N = 519$ ). Median lag from program entry to interview was 14.8 months, with 90 percent of interview occurring between 12 and 18 months after program entry.

Over the 15-month follow-up period, participants' household income increased and the percentage living in poverty decreased, but public assistance benefits receipt did not change.

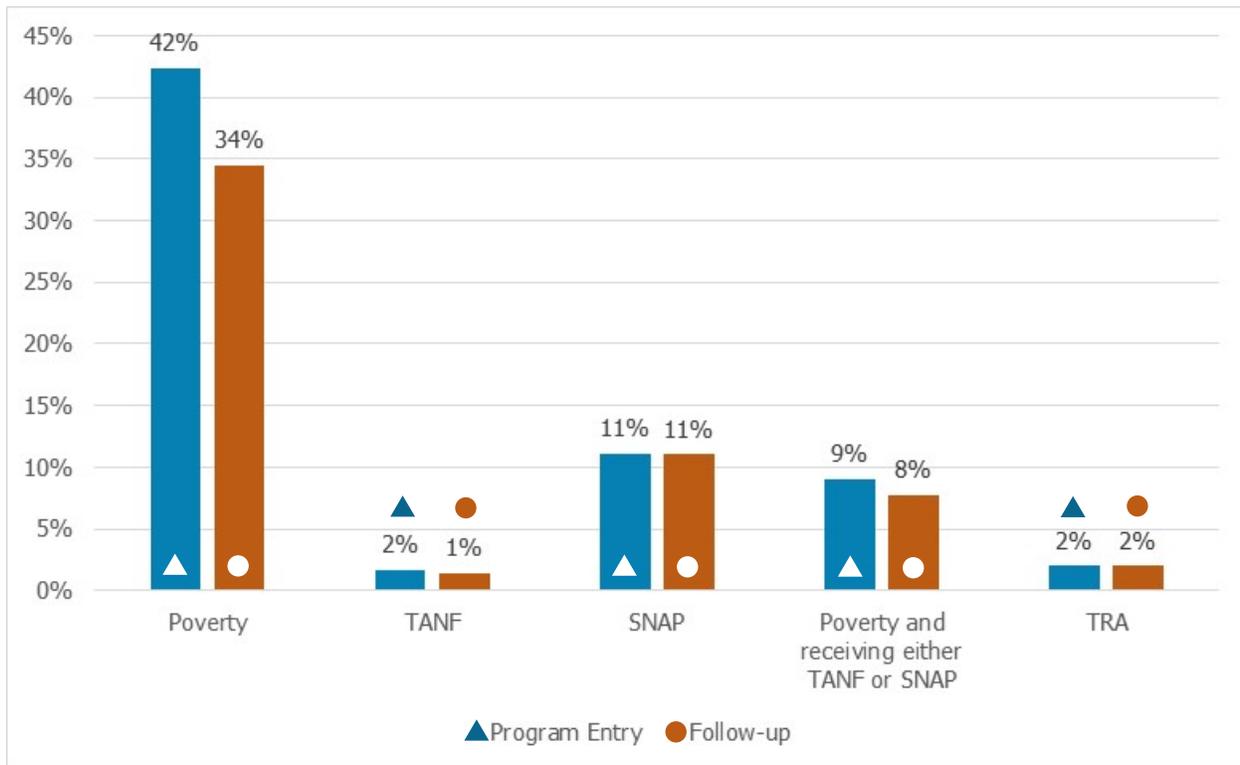
Average household income increased from \$33,944 at the time of program entry to \$38,148, according to the short-term participant follow-up survey, an increase of \$4,204, or 12 percent (not shown). As **Exhibit 4-23** shows, the proportion of study participant households in poverty decreased during the follow-up period, from 42 percent at program entry to 34 percent 15 months after entry, a decrease of 8 percentage points.

**Exhibit 4-23** also shows public assistance benefit receipt. The proportion of study participants receiving SNAP, TANF, or TRA remained consistent between program entry and the end of the follow-up period, with very few participants receiving benefits.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Nineteen (19) percent of participants reported receiving means-tested public assistance (including TANF and SNAP) as well as other federally funded assistance programs (e.g., TRA and Social Security Disability Insurance (SSDI)) at about 15 months after program entry (not shown). Change over time is not presented in [Exhibit 4-23](#) for this broader measure of public assistance benefits receipt because of wording changes in the survey from program entry to follow-up.<sup>44</sup>

**Exhibit 4-23. Household Poverty Status and Receipt of Public Assistance Benefits over Study Period**



Source: Short-term participant follow-up survey

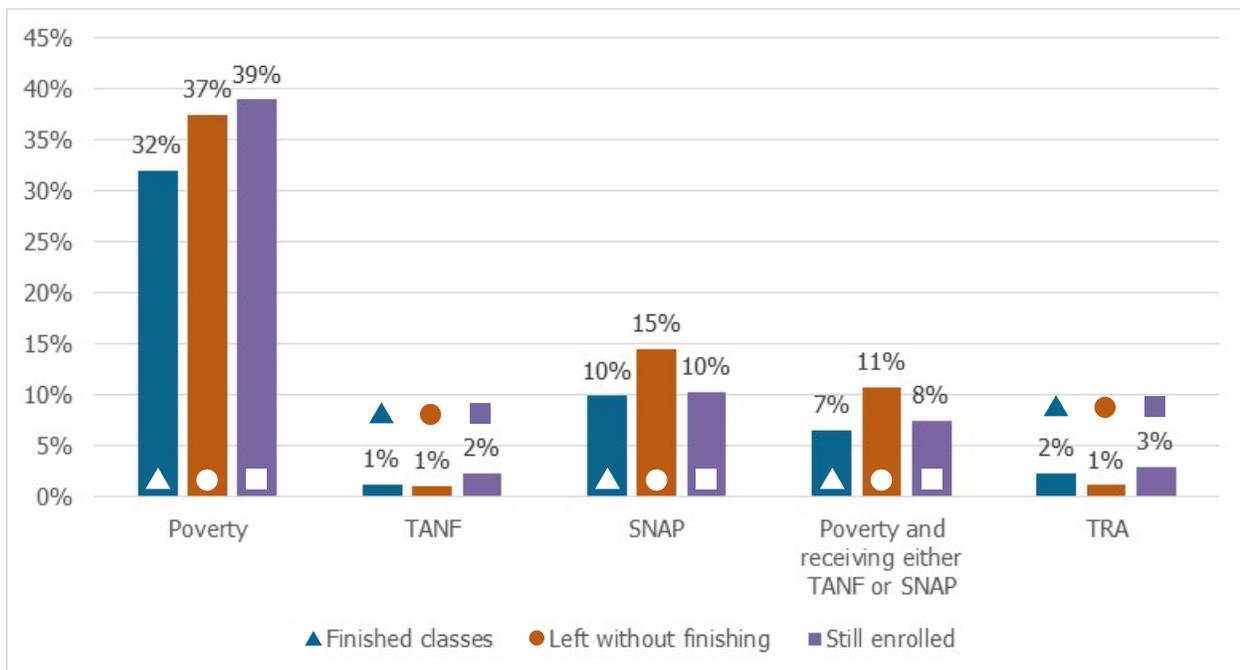
Note: Sample includes all survey respondents (N = 2,211). Median lag from program entry to interview was 14.8 months, with 90 percent of interview occurring between 12 and 18 months after program entry.

<sup>44</sup> At program entry, participants reported receipt of TRA, TANF, SNAP, and Unemployment Insurance on the Baseline Information Form. About 15 months later, they reported receipt of TRA, TANF, SNAP, and "any other federally funded programs such as Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI), veterans' benefits, Housing Choice Voucher Program (formerly known as Section 8), or Public Housing" on the short-term participant follow-up survey.

## CHAPTER 4: CHARACTERISTICS OF PARTICIPANTS AT PROGRAM ENTRY AND OUTCOMES A YEAR LATER

Poverty status and public assistance receipt at follow-up varied by enrollment status. As shown in **Exhibit 4-24**, 32 percent of those who finished their classes were below the poverty level, compared to 37 percent of those who left without finishing and 39 percent of those still enrolled. SNAP receipt was highest for those who left without finishing (15 percent, compared to 10 percent for those who finished their classes or were still enrolled).

**Exhibit 4-24. Household Poverty Status and Receipt of Public Assistance Benefits at Follow-up, by Enrollment Status**



Source: Short-term participant follow-up survey

Note: Sample includes all survey respondents ( $N = 2,211$ ). Median lag from program entry to interview was 14.8 months, with 90 percent of interview occurring between 12 and 18 months after program entry.

## 5. Participant Outcomes, by Characteristics at Program Entry

This chapter explores whether outcomes varied by participants' socioeconomic, demographic, and educational characteristics at program entry. In doing so, it addresses the following research question:

*Which subgroups of participants were most likely to complete grant-funded programs? Begin jobs in their occupation of training? Have higher post-training earnings?*

The subgroup analysis provides important insights about *who* benefits most (and least) from programs such as those funded by TAACCCT under the general economic conditions prevailing during the study period, between late 2017 and early 2019. Such an understanding can help policymakers and program designers refine program eligibility requirements or implement future programs that achieve more equitable outcomes across socioeconomic, demographic, and educational groups.

Different outcomes across subgroups may be due to the subgroup status itself or due to other factors that are frequently associated with that subgroup. For example, in the analysis presented below, a larger percentage of participants who had some postsecondary education at program entry completed their program than participants without such education. This difference may be due to the prior education itself or to factors commonly associated with those who have more education, such as more motivation and higher socioeconomic status. The analysis does not differentiate between these possibilities.

Given the large number of characteristics measured at program entry and outcomes measured 15 months later, the research team focused on 10 characteristics at program entry and four outcomes. These choices were guided by the TAACCCT theory of change presented in Chapter 2.

### Key Takeaways: Participant Outcomes by Characteristics at Program Entry

- Older participants and those with some postsecondary education had higher rates of program completion.
- Training-related employment was lower for public assistance recipients, those with less education, and those who had not worked in the year prior to enrollment.
- Earnings increases were larger for younger participants and lower for those who were not employed at enrollment but worked in the previous year.
- Participants enrolled in longer programs experienced larger earnings increases than those enrolled in shorter training programs. There was no detectable difference in program completion, training-related employment, or public assistance receipt by program duration.
- Participants previously employed in manufacturing had higher rates of training-related employment and larger earnings increases than those employed in certain other industries.
- Older participants, those with long periods without employment, and those receiving public assistance at program enrollment had higher rates of public assistance receipt a year later.

## CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

The characteristics at program entry are:

- Sex,
- Race/ethnicity,
- Veteran status,
- TRA receipt,
- TANF and SNAP receipt,
- Prior postsecondary education,
- Age,
- Time since last job,
- Previous industry, and
- Program duration.<sup>45</sup>

The follow-up outcomes are:<sup>46</sup>

- Program completion,
- Training-related employment,
- Change in earnings, and
- Public assistance benefit receipt.

Many of the exhibits in this and subsequent chapters show estimates with confidence intervals. A *confidence interval* is a measure of uncertainty. Though there is very little

uncertainty about outcomes for the participants who enrolled in the 34 programs during the study period, there is considerable uncertainty about outcomes for future participants—especially what outcomes might be for participants who enroll in programs offered by new grantees if there were another round of TAACCCT grants or similar types of grant programs. The confidence intervals in this report represent the range of possible outcome levels that would be expected for programs from a new round of grants, assuming the same general economic conditions and same grant competition rules. Clearly these conditions would not apply during the COVID-19 pandemic, but they could return in a few years, near the end of the next expansionary business cycle. More information on the calculation and interpretation of these confidence intervals is provided in Appendix B, Section B.5.

Outcomes levels are presented for each subgroup, along with a 95 percent confidence interval. Confidence intervals are narrower (reflecting less uncertainty) for outcomes based on larger sample sizes

### Interpreting Exhibits in Chapters 5 and 6

The purple circles in each exhibit are the observed average outcomes for the particular subgroup. The blue lines extending sideways from each circle indicate the length of a 95 percent confidence interval.

The research team conducted statistical tests to determine which differences between subgroups were statistically significant.

- For subgroups with two categories (e.g., sex: male, female), a single test was conducted to determine whether the difference was significant.
- For subgroups with more than two categories (e.g., race/ethnicity: black (non-Hispanic), white (non-Hispanic), Hispanic, etc.), the category with the most members was designated as the “reference group” (labeled with “[reference group]” in the exhibits). Statistical tests for differences were conducted between the reference group and each of the other categories in that subgroup.

In the exhibits, differences that are significant at the .05 level are identified with dark purple circles; non-significant differences are identified with light purple circles.

<sup>45</sup> See Appendix C for detailed descriptions of the measurement strategies for these subgroups. The research team studied subgroups defined by combinations of age and time since last job.

<sup>46</sup> See Section 2.3 of Chapter 2 for additional discussion of why the team chose these variables for closer examination across Chapters 5, 6, and 7.

## CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

and for outcomes that are more consistent across programs. Confidence intervals are wider (reflecting more uncertainty) for outcomes based on smaller sample sizes and outcomes that vary widely across the 34 programs. For example, outcomes based on NDNH data generally have smaller confidence intervals, because almost all study participants are included in the sample. Confidence intervals are generally larger for subgroups, especially those with small sample sizes (e.g., TANF recipients).

The research team conducted statistical tests to determine which differences between subgroups were statistically significant.<sup>47</sup> In cases where there is more than one group within a category, the largest group was designated as the “reference group” and statistical tests for differences were conducted between the reference group and each of the remaining categories.<sup>48</sup> The statistical tests in this chapter account for variation in outcome levels across programs. In general, differences will only be significant if the differences are fairly consistent across the 34 programs.

The remainder of this chapter is organized by the four outcomes. Detailed tables underlying the figures are available in Appendix G.

### 5.1. PROGRAM COMPLETION

This section explores how the share of participants who completed their program varied by subgroup. As noted in Chapter 4, 51 percent of all participants “completed” their program of study; that is, they finished classes for their program and received a credential by about 15 months after program entry.

**Exhibit 5-1** shows program completion, by participant characteristics at program entry. As detailed below, older participants and those with some postsecondary education had higher rates of program completion than did younger participants with no postsecondary education.

**There was no detectable difference in program completion by sex, veteran status, public assistance benefit receipt, or program duration.**

About 50 percent of men completed their program, with a confidence interval that ranges between 39 percent and 61 percent. About 59 percent of women completed their program, with a confidence

<sup>47</sup> Tests were simple two-sided two-sample tests based on standard errors calculated as described in Appendix B, Section B.5 and the assumption of asymptotic normality. If the absolute difference between the mean outcomes across the two groups was more than 1.96 times as large as the estimated standard error on the difference, then the pair of domains was flagged as having statistically different mean outcomes.

<sup>48</sup> Alternative procedures would have been to test for at least one difference or to test all possible pairwise differences. The research team found it most interesting to always compare less common groups to the most common group.

#### Survey Questions: Program Completion

##### From the short-term participant follow-up survey:

Are you still taking classes required for the [PROGRAM NAME] at [SCHOOL NAME], or did you complete the required classes, or did you stop without completing them? If you are between terms, please consider that as currently taking these classes.

- Still taking classes
- Finished the classes
- Stopped without finishing the classes

[IF NOT STILL TAKING CLASSES] Were you awarded one or more industry-recognized certificates, licenses, or credentials as a result of completing the required classes for the [PROGRAM name] at [SCHOOL NAME]?

- Yes
- No

## CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

interval that ranges between 45 percent and 73 percent. The difference in program completion between men and women was not significant, nor was the difference between veterans (44 percent) and non-veterans (52 percent). Similarly, there were no detectable differences in program completion for subgroups defined by receipt of public assistance benefits (TRA, TANF, or SNAP) or by program duration.

| **There was no detectable difference in program completion for any race/ethnic group as compared to white (non-Hispanic).**

For race and ethnicity, white (non-Hispanic) is the largest subgroup, designated as the reference group. None of the differences between white (non-Hispanic) and the other three groups were statistically significant.

| **Participants age 25 and older had higher program completion rates than younger participants, regardless of prior employment.**

**Exhibit 5-1** also examines program completion by age and time since last job. This analysis includes nine categories; the largest category is age 24 or younger and currently employed, designated as the reference group. Participants age 25 to 34 had significantly higher program completion rates regardless of their employment history than had the reference group, as did participants age 35 or older with past or current work experience. The analysis does not provide insight into the cause of these differences; it is nonetheless interesting that most of the older groups are more successful than young participants at completing their program. Within each of the age groups, those who were not working at program entry but who had some employment in the past year had the highest rates of program completion—perhaps because those workers were able to participate in their program full-time.

| **Participants with some postsecondary education at program entry had higher program completion rates than those without any postsecondary education.**

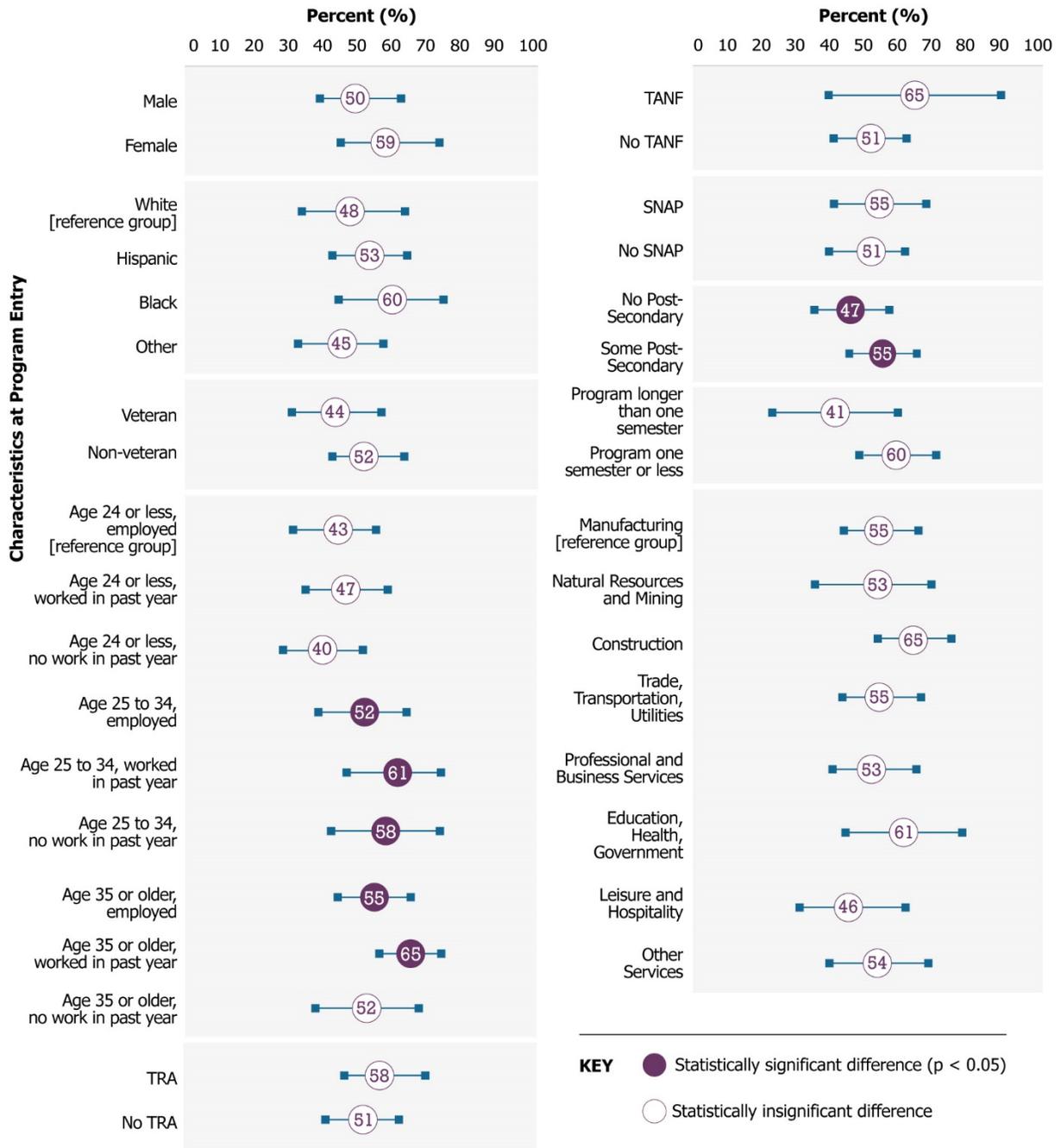
Fifty-five (55) percent of those with some postsecondary education at program entry completed their program, compared to 47 percent of those with no postsecondary education; this difference is statistically significant, as noted with the dark purple circles in **Exhibit 5-1**. A possible conclusion from this finding is that prior postsecondary experience helps participants to finish their courses and earn the associated credential. However, as noted earlier, prior postsecondary experience could merely be associated with other characteristics (e.g., cognitive ability, motivation, social and family supports) that are producing the different outcomes.

| **Compared to manufacturing, the most common former industry, there was no compelling evidence that study participants with former experience in other industries had different program completion rates.**

**Exhibit 5-1** also shows program completion by the industry in which participants worked before enrolling in their grant-funded program, for those not employed at program entry. The analysis includes eight categories; manufacturing is designated as the reference group. Although there is variation in the estimated program completion rates across industries, there was no detectable difference in program completion between manufacturing and any of the other seven industries.

# CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

**Exhibit 5-1. Program Completion, by Participant Characteristics at Program Entry**



Source: Baseline Information Form and short-term participant follow-up survey

Note: Sample size is 2,211 survey respondents; for former industry, sample is limited to participants who were not employed at program entry but had some previous work experience (N=883). Average is denoted with circles; bounds of 95 percent confidence interval are denoted with squares. For subgroups with more than two categories, the category with the largest number of members is designated as the "reference group," and tests for differences were conducted between the reference group and each of the other categories. Expanded results are reported in Appendix G.

## 5.2. EMPLOYMENT AND EARNINGS OUTCOMES

This section explores how select labor market outcomes—training-related employment and change in earnings—varied across subgroups. The team chose to focus on these two labor market outcomes because together they cover both current and future benefits of training. Even if study participants do not immediately start earning high wages, the fact that they have training-related employment suggests potential that their earnings will eventually increase as a result of the training. If on the other hand, they cannot obtain employment relevant to their training, it seems very unlikely that they will ever benefit financially from the training,

As discussed in Chapter 4, participants who finished their classes had more success obtaining training-related employment than participants who left without finishing. Because of this, the team considered repeating subgroup analyses separately for participants who finished their classes versus those who left without finishing, but ultimately decided against such an analysis. There were several reasons for this decision. First and most importantly, no participant enters a program with the intent to stop without finishing it, so such analyses would not be relevant to any specific population. Second, it would have doubled the number of comparisons, making it difficult for readers to take away a clear message. Third, participants who finished their classes were not more successful in the other primary outcome of this section—earnings growth. Fourth, there were anecdotal reports that the decision to stop attending classes before finishing was not necessarily a sign of failure. Discussions during site visits indicated that for some programs, employers were so eager for employees that employers recruited program participants before they finished their grant-funded training.

Another important caveat is that the follow-up period is relatively short for assessing employment and earnings outcomes, particularly for longer programs. The outcomes presented in this section may change over time as the longer-term effects of grant-funded training are fully realized. For example, the evaluation of the Project QUEST program found that it did not produce impacts on earnings until several years after program entry.<sup>49</sup>

### Study Population

The sample in this section includes only participants who had finished their classes or left without finishing at the time of survey follow-up.

This decision was mandatory for training-related employment because of the skip pattern in the survey and made sense to also impose on analysis of NDNH data.

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<sup>49</sup> The earnings impacts for Project QUEST’s participants did not emerge until the fourth year and continued for nine years (Roder and Elliot 2019). Recognizing that it can take time for impacts to emerge, studies of job training programs are increasingly using longer follow-up periods. For example, the WIA Gold Standard evaluation had a three-year follow-up period (Fortson et al. 2017). Some evaluations have included much longer follow-up periods, such as the National Job Corps study, which collected earnings data for more than 10 years (Schochet et al. 2006). In addition, the evaluations of the Health Profession Opportunity Grants (HPOG) and Pathways for Advancing Careers and Education (PACE) programs are using a six-year follow-up period (<https://www.acf.hhs.gov/opre/research/project/career-pathways-long-term-outcomes-study>).

### 5.2.1 Training-Related Employment

**Exhibit 5-2** shows the share of participants employed in a job related to their training, by participant characteristics at program entry. As reported in Chapter 4, across all participants, 33 percent were employed in a job closely related to their training after finishing or leaving training. As discussed below, training-related employment varied across a number of subgroups.

| **Black (non-Hispanic) participants had lower rates of training-related employment than white (non-Hispanic) participants.**

**Exhibit 5-2** also shows that black (non-Hispanic) participants had significantly less success obtaining a job related to their training than did white (non-Hispanic) participants (22 versus 36 percent). There were no significant differences in training-related employment by sex or veteran status.

| **SNAP recipients and participants with no postsecondary education had lower rates of training-related employment.**

**Exhibit 5-2** also shows that SNAP recipients (22 percent) had significantly less success obtaining job-related training than non-recipients (34 percent). Note that this disparity is not due to differences in enrollment status because, as discussed above, SNAP recipients finished their training courses and earned a credential at a rate not significantly lower than participants not receiving SNAP. In addition, participants with no postsecondary education at program entry (28 percent) had significantly lower rates of employment in a job related to training than those with some postsecondary education (37 percent). This disparity could be due to differences in program completion rates because, as discussed above, participants without prior postsecondary experience were much less likely to complete their program. There were no detectable differences in training-related employment by TRA or TANF receipt at program entry, nor by duration of program.

| **Participants age 25 to 34 and those with more recent employment had the highest rates of training-related employment.**

**Exhibit 5-2** also shows that rates of training-related employment differed across subgroups defined by age and prior employment. Participants of ages 25 to 34 who were employed at program entry had a significantly higher rate of training-related employment (41 percent) than those ages 24 or younger who were employed at program entry (33 percent).

Participants with more recent employment also had higher rates of training-related employment. Participants age 24 or younger employed at program entry or who had worked in the past year had significantly higher rates of training-related employment than participants of the same age who were not employed in the year prior to program entry.

#### Survey Questions: Training-Related Employment

##### From the short-term participant follow-up survey:

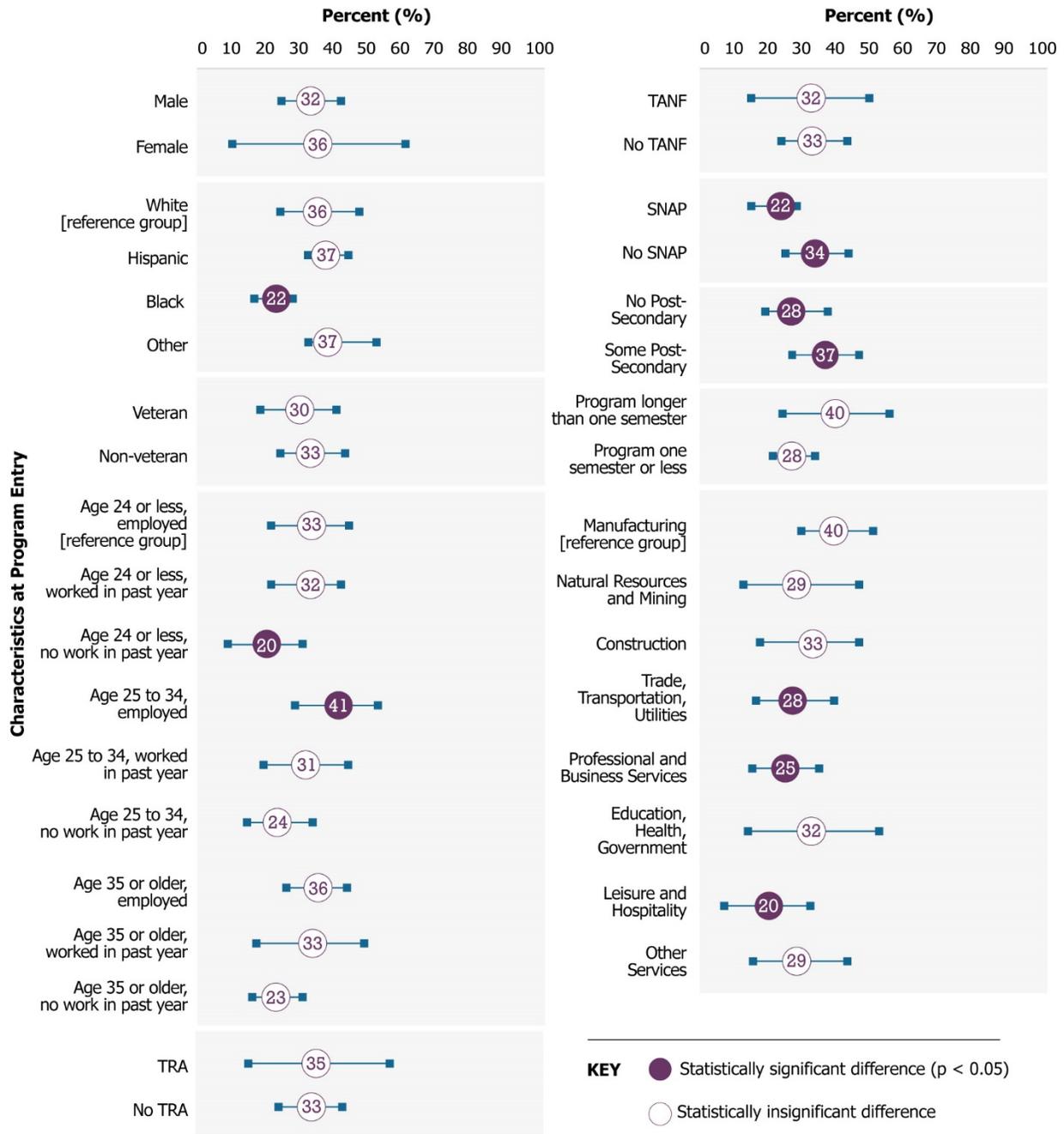
How closely related is this job to the education and training you received as part of [PROGRAM NAME] and [SCHOOL NAME]? Would you say...

- Closely related
- Somewhat related
- Not related

If the respondent was currently employed and answered "closely related" to this question, then the research team classified that participant as having training-related employment.

# CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

**Exhibit 5-2. Training-related Employment, by Participant Characteristics at Program Entry**



Source: Baseline Information Form and short-term participant follow-up survey

Note: Sample size is 1,834 survey respondents who had finished their classes or left without finishing by about 15 months after program entry; for industry, sample is limited to participants who were not employed at program entry but had some previous work experience (N=756). Average is denoted with circles; bounds of 95 percent confidence interval are denoted with squares. For subgroups with more than two categories, the category with the largest number of members is designated as the "reference group," and tests for differences were conducted between the reference group and each of the other categories. See Appendix G for expanded results.

## CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

Participants previously employed in manufacturing had higher rates of training-related employment than those employed in other industries.

**Exhibit 5-2** also shows there were differences in training-related employment by prior industry. Forty (40) percent of participants who previously worked in the manufacturing sector were employed in a job related to their training. This was a higher rate than participants who were previously employed in trade, transportation, and utilities (28 percent), professional and business services (25 percent), or leisure and hospitality (20 percent).

### 5.2.2 Change in Earnings

Among participants who had finished their classes or left without finishing, average quarterly earnings increased by \$2,359 between the third quarter before program entry and the fifth quarter after program entry (or about \$9,500 per year). As shown in **Exhibit 5-3**, and discussed in more detail below, the change in earnings varied across a number of subgroups.

There were no statistically significant differences in the change in earnings by sex or veteran status.

**Exhibit 5-3** shows that there were no differences in training-related employment or quarterly earnings by sex or veteran status. Quarterly earnings data were not available for race/ethnicity subgroups, so they are not included in this analysis.<sup>50</sup>

TRA recipients had a decrease in quarterly earnings.

**Exhibit 5-3** also shows that TRA recipients had a decrease in quarterly earnings of \$2,218, whereas non-recipients saw an increase of \$2,443. This finding is possibly due to TRA recipients being workers laid off from typically higher-paying trade-affected industries, such as manufacturing. TRA recipients had earned an average of nearly \$8,500 in the third quarter before program entry, substantially more than non-TRA recipients, who had earned about \$5,000 in that same quarter. TRA participants likely had challenges obtaining a similarly high-paying job in the year after program entry.

SNAP recipients had smaller earnings increases than non-recipients.

**Exhibit 5-3** also shows that SNAP recipients experienced an increase in quarterly earnings of \$1,511, compared to \$2,471 for non-recipients. There was no detectable difference in earnings change by TANF receipt at program entry.

Participants enrolled in longer programs had significantly larger earnings increases than those enrolled in shorter programs.

**Exhibit 5-3** also shows that participants enrolled in programs longer than one semester had more than double the increase in quarterly earnings (\$3,358) as those enrolled in shorter programs (\$1,680). It is possible that longer programs were more beneficial to participants and produced larger earnings increases than shorter programs. However, it is also possible that participants who enrolled in longer programs were different in other ways from participants who enrolled in shorter programs, and that those differences instead led to the larger increase in earnings.

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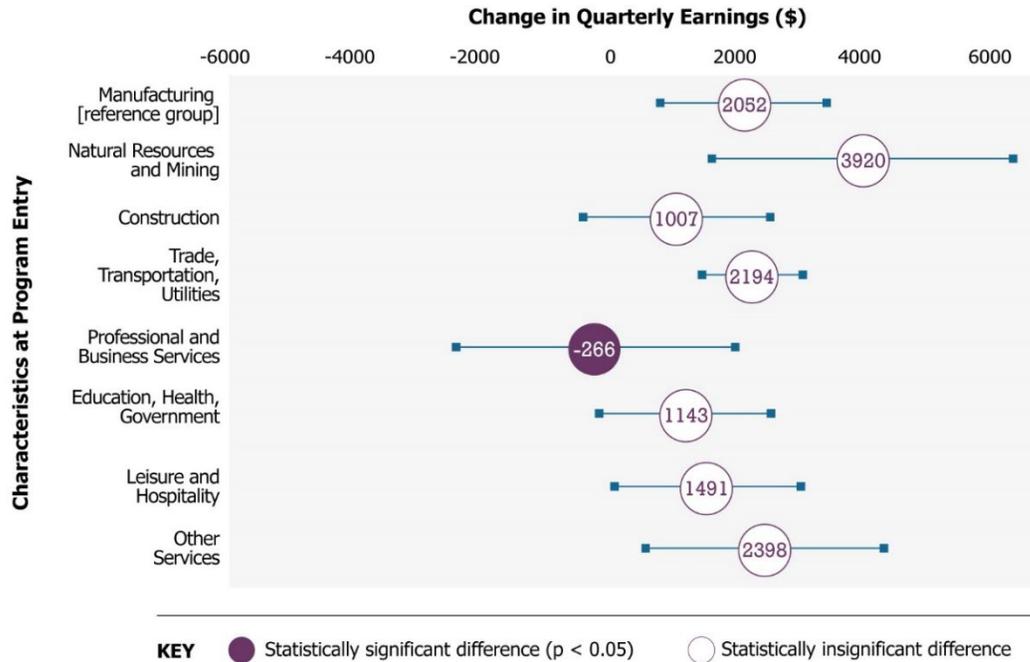
<sup>50</sup> Because of an oversight, ethnicity data was not available on the file that could be merged with earnings data.

# CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

**Exhibit 5-3. Two-Year Change in Quarterly Earnings, by Participant Characteristics at Program Entry**



## CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY



Source: National Directory of New Hires and Baseline Information Form

Note: Sample size is 1,571 survey respondents who had finished classes or left without finishing by the short-term follow-up survey and had sufficient information at program entry for matching to NDNH wage records; for former industry, sample is limited to participants who were not employed at program entry but had some previous work experience (N=688). Quarterly earnings data were not available for race/ethnicity subgroups. Average is denoted with circles; bounds of 95 percent confidence interval are denoted with squares. For subgroups with more than two categories, the category with the largest number of members is designated as the “reference group,” and tests for differences were conducted between the reference group and each of the other categories. Expanded results are reported in Appendix G.

**Younger participants—especially those employed at program entry or who had not worked in the past year—experienced the largest earnings gains.**

**Exhibit 5-3** also shows that in contrast to the results for program completion and training-related employment, earnings increases were largest for younger participants, especially those employed at program entry. Quarterly earnings rose by \$4,061 for participants age 24 or less who were employed at program entry, compared to an increase of \$2,159 for those age 25 to 34 and \$2,494 for those age 35 or older. One possible explanation for this finding is that younger workers had lower earnings at program entry than older workers, and due to their age came to the program with less professional knowledge and experience. If this were the case, the program would have provided a larger relative increase in skills for younger workers than older workers, which in turn would lead to larger earnings gains. Across age categories, those who were not employed at program entry but who worked in the previous year had the smallest earnings gains.

**Participants previously employed in professional and business services experienced a net earnings loss over the two-year period.**

**Exhibit 5-3** also shows that those who were previously employed in manufacturing experienced a larger earnings gain than those previously employed in professional and business services. Participants previously employed in manufacturing had an increase in quarterly earnings of \$2,052, whereas those employed in professional and business services had a \$266 decrease.

### 5.3. RECEIPT OF PUBLIC ASSISTANCE BENEFITS

As reported in Chapter 4, nearly one-fifth (19 percent) of participants reported receiving means-tested public assistance benefits (including TANF and SNAP) as well as other assistance from other federally funded programs (e.g., TRA and SSDI) by about 15 months after program entry. This section explores whether this rate varied across subgroups.

As shown in **Exhibit 5-4** and discussed in more detail below, black (non-Hispanic) participants, those who were receiving benefits at program entry, older participants, and those with long periods unemployed had higher rates of public assistance benefit receipt.

#### Public Assistance Programs included in this Study

- TANF (Temporary Assistance for Needy Families)
- SNAP (Supplemental Nutrition Assistance Program) (formerly called the Food Stamps Program)
- TRA (Trade Readjustment Allowances)
- Other federally funded programs such as Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI), veterans' benefits, Housing Choice Voucher Program (formerly known as Section 8), or Public Housing

| **More black (non-Hispanic) than white (non-Hispanic) participants received public assistance benefits.**

Twenty-seven (27) percent of black (non-Hispanic) participants received public assistance by about 15 months after program entry, compared to 16 percent of white (non-Hispanic) participants.

| **More veterans received public assistance benefits.**

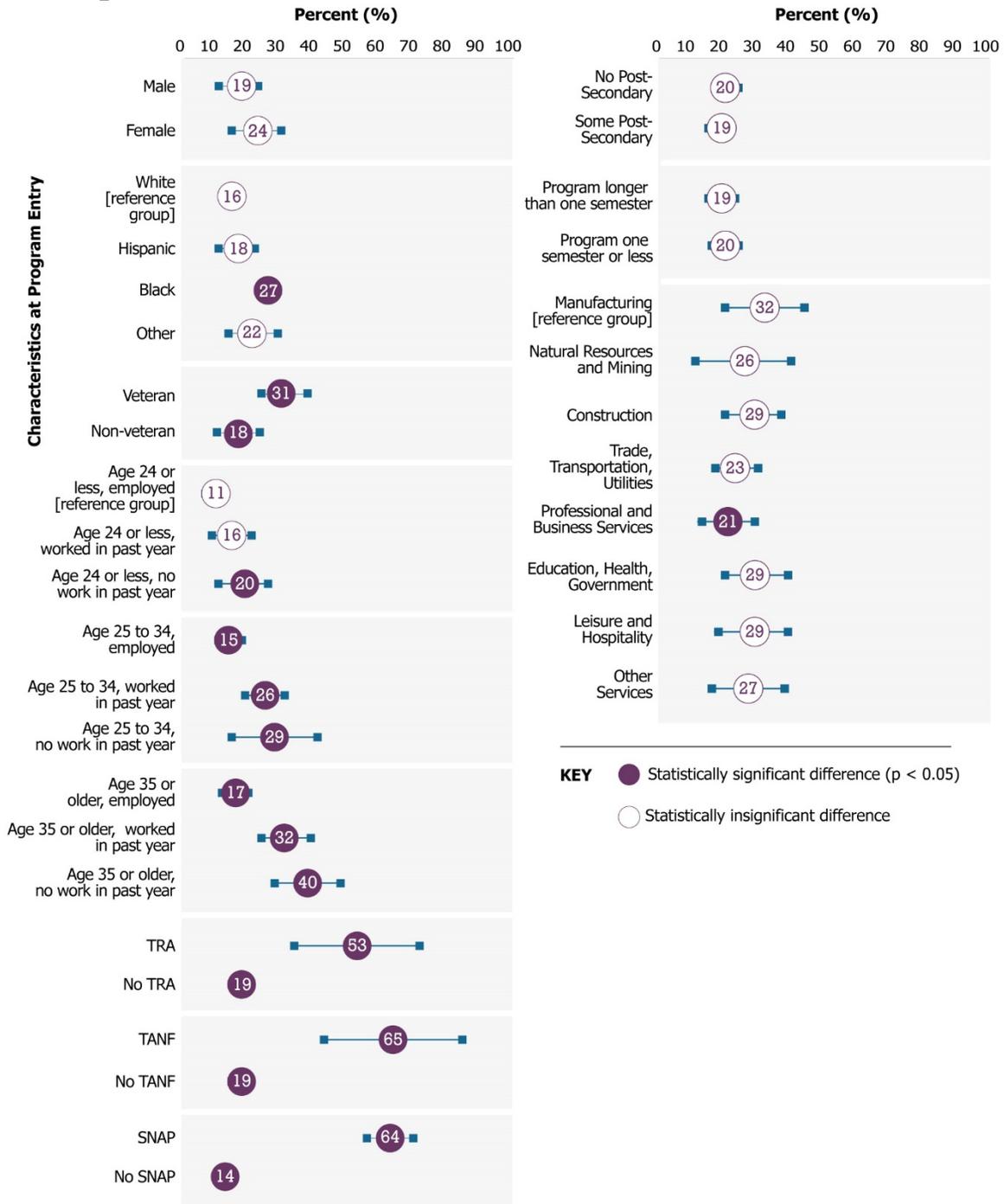
Among veterans, 31 percent received benefits, much higher than the rate among non-veterans (18 percent). One factor that likely affected this result is that one of the benefits included in the outcome was veterans' benefits, which only veterans are eligible to receive. The study did not examine variation in receipt of just means-tested public assistance benefits by veteran status.

| **Most participants who received SNAP, TANF, or TRA benefits at program entry were still receiving public assistance benefits 15 months later.**

As discussed in Chapter 4, overall receipt of public assistance benefits barely changed from program entry to 15 months later, but this was due to a mixture of people stopping benefits and others starting them. Unsurprisingly participants who received SNAP, TANF, or TRA benefits at program entry received benefits at significantly higher rates at follow-up than those who were not receiving these benefits at program entry. For example, 65 percent of participants who received TANF at program entry were receiving some type of public assistance benefit at follow-up, compared to 19 percent of participants who did not receive TANF at program entry. There were no differences in public assistance benefit receipt for subgroups defined by educational attainment or program duration.

## CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

**Exhibit 5-4. Public Assistance Benefit Receipt 15 Months after Program Entry, by Participant Characteristics at Program Entry, Including Receipt of Public Assistance from Selected Federal Programs**



Source: Baseline Information Form and short-term participant follow-up survey

Note: Sample size is 2,211 survey respondents; for former industry, sample is limited to participants who were not employed at program entry but had some previous work experience (N=883). Average is denoted with circles; bounds of 95 percent confidence interval are denoted with squares. For subgroups with more than two categories, the category with the largest number of members is designated as the "reference group," and tests for differences were conducted between the reference group and each of the other categories. Expanded results are reported in Appendix G.

## CHAPTER 5: PARTICIPANT OUTCOMES, BY CHARACTERISTICS AT PROGRAM ENTRY

Eleven percent of younger participants employed at program entry received public assistance benefits, a rate lower than most other groups defined by age and duration of unemployment at program entry.

Public assistance benefit receipt differed by age and length of unemployment at program entry. Crossing three levels of age (24 years or less, 25 to 34 years, and 35 years or more) by three levels of length of unemployment (employed, employed within the prior year, and not employed within the prior year) yields nine subgroups. Seven of these subgroups had significantly higher rates of benefit receipt than the reference category (24 years or less and employed). For example, 40 percent of those age 35 or older who had not worked in the year prior to program entry were receiving public assistance benefits, compared with 11 percent of those age 24 or less and employed.

Among those with some employment within the year prior to program entry but not employed at that time, public assistance benefit receipt varied by industry of prior employment.

As noted previously, manufacturing was the most common prior industry for participants who were not employed at program entry but who had been employed within the prior year. Compared to this reference group, one prior industry had a rate of public benefits that was significantly lower. Despite their net loss in earnings (\$266 decrease in earnings, as reported in **Exhibit 5-3**), among participants who last worked in professional and business services, only 21 percent received public assistance benefits at follow-up. This is significantly lower than participants who last worked in manufacturing (32 percent).

## 6. Participant Outcomes, by Service Receipt

Chapter 5 presented simple differences in average outcomes between subgroups defined by participant characteristics at program entry without any adjustment for other differences between the subgroups. This chapter takes a different approach. It presents simple differences in average outcomes between subgroups defined by the receipt of supportive services and modes of instruction, *and* it adjusts these differences for known differences at program entry between the subgroups. The hope is that these adjusted differences will approximate the impacts of the services and modes of instruction, but caution is required for this reading, as is explained below. Full methodological details may be found in Appendix D. See the text box on the next page for a condensed and less technical description of the methods employed in this chapter.

### Warning

The analysis methods in this chapter make strong assumptions. Please be advised that results are not as definitive as those in prior chapters.

This chapter addresses the following research question:<sup>51</sup>

*Do study participants who utilize various services have better outcomes, after controlling for characteristics at program entry?*

This is an important question because, as reported in Chapter 4, most participants did not have postsecondary education experience when they entered their program and many were older, meaning that many years had passed since their last time in school. Returning to school can be a daunting challenge. TAACCCT programs implemented a range of supportive services beyond basic classroom instruction, with the aim of helping participants persist in and complete their programs. However, it is difficult to determine the effect of services on retention and completion. Some supportive services may be ineffective or even counterproductive. So estimates of service efficacy should be useful to designers of future college-based programs for adult learners.

### Key Takeaways: Service Receipt and Participant Outcomes

- The combination of work-based learning and employment-related services is strongly associated with program completion and training-related employment.
- Skills practice in work-like physical environments is associated with program completion and stronger earnings growth.
- Transfer credits, financial aid advising, all three work-based learning services, and both employment related services had positive associations with training-related employment.
- Transfer credits had a positive association with earnings growth among participants not still enrolled in the program as of follow-up.
- Three of the four persistence and completion services were associated with public assistance receipt, while none had significant associations with poverty.
- Opportunities for direct occupational experience were also associated with public assistance receipt.

<sup>51</sup> Full methodological details may be found in Appendix D. See the text box on the next page for a condensed and less technical description of the methods employed in this chapter.

### Analytic Methods and Interpreting Adjusted Differences

Please see Appendix D for full details on methods employed in this chapter. In brief, this chapter estimates adjusted differences in average participant outcomes across subgroups defined by receipt of supportive services and modes of instruction. The adjusted differences are based on comparing predicted and actual outcome levels for participants who receive a particular service and those who do not. The basic analytic method is as follows:

For each service and each outcome:

1. Predict the outcome level for those participants who received the service and those who did not, using participant characteristics at program entry. This is the expected outcome rate.
2. Calculate the actual level of the outcome for those who received the service and those who did not. This is the actual outcome rate.
3. Calculate the difference between the actual and expected outcome rates, separately for those who received the service and those who did not. This is the excess outcome rate.
4. Calculate the difference between the excess outcome rate for those who received the service and those who did not. This difference is the adjusted difference between those receiving and those not receiving the service. Under strong assumptions explained below (and in more detail in Appendix D), this adjusted difference is a consistent estimate of the impact of the service.

The research team performed tests for statistical significance of the adjusted differences. Adjusted differences with a p-value of less than .05 are considered to be statistically significant. This means that if the true adjusted difference were zero, then the probability of observing an estimated adjusted difference as large or larger would be less than 5 percent.

Because service receipt was not randomly assigned, interpretation of the adjusted differences as impacts requires that *none* of the following conditions are true:

- The decision to utilize a service is related to an unmeasured factor at program entry that also directly influences the likelihood of achieving the target outcome;
- The decision to utilize a service is related to early academic progress that is different than what would be expected based on factors measured at program entry;
- Local availability of the service is related to unmeasured local labor market conditions; or
- The service is bundled with other services.

While it seems implausible that none of these conditions are ever true, the adjusted differences almost certainly provide better clues and hints about the efficacy of the various services than one could obtain from the unadjusted difference because the research team was able to collect a rich set of characteristics at program entry to use in the adjustment. The text accompanying many of the statistically significant estimated impacts explores possible reasons other than service receipt for the adjusted differences.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

The answer to this question is necessarily more tentative than the answers to the questions of the prior chapters. The basic research technique is to compare outcomes for those who received a service with outcomes for those who did not receive the service. However, there can be many reasons why some people utilize a service when others do not. Service receipt may be associated with a range of other factors that affect participant outcomes but have little to do with the service itself.

To approximate the impact of each service, the research team prepared adjusted differences. Strong assumptions about the reasons for service receipt and the potential pathways from program entry through service receipt to training outcomes are necessary for the adjusted differences to be safely interpreted as service impacts. The box **Analytic Methods and Interpreting Adjusted Differences** above gives an overview of the team’s analytic approach and examples of ways that these strong assumptions might fail to be true. Readers should be mindful that the adjusted differences estimated in this chapter are not as credible as they would have been had it been possible to randomly assign services to participants. Some of the adjusted differences are more plausible estimates of impacts than others; the detailed text in this chapter discusses the plausibility of each result. As mentioned earlier, for extensive detail on the methodology, see Appendix D.

Given the variety of services and outcomes measured, the potential number of connections that could be estimated is very large. To make this exploration more digestible, the team chose to focus on the connections of 11 services with four outcomes. The selected 11 services are prominently featured in grantees’ plans. The list is not meant to be exhaustive and very well may exclude important services (the availability of instructors for after-class consultation, for example). The data source—the short-term participant follow-up survey—included questions about service receipt. Those questions aligned with the three categories of capacity-building strategies described in the TAACCCT theory of change (Chapter 2), although the wording differs slightly and the *connections to employment* category is divided into two subcategories (*work-based learning* and *employment-related services*):

### Measurement of Service Receipt

#### Accelerated and Enhanced Learning

1. Transfer credits (earned previously at the same college or at other colleges), or
2. Credit for prior learning (e.g., in the military, apprenticeship programs, or other work experiences).

#### Persistence and Completion

3. Career counseling,
4. Academic advising,
5. Financial aid advising, or
6. Workplace skills/general life skills.

#### Connections to Employment—Work-based Learning

7. Skills practice in a virtual setting,
8. Skills practice in a work-like physical environment, or
9. In-program work experience (e.g., internship).

#### Connections to Employment—Employment-Related Services

10. Job search or placement assistance, or
11. Interviewing practice.

As in Chapter 5, these analyses focus on four outcomes:

- Program completion;
- Training-related employment;

- Change in earnings; and
- Receipt of public assistance benefits<sup>52</sup>

The rest of this chapter is organized by these four outcomes. Within each section, the impacts (adjusted differences) of the 11 services on the focal outcome are presented and discussed. The discussion of impacts of the services on program completion in Section 6.1 is more detailed than the corresponding discussions in the remaining sections—specifically, Section 6.1 provides more detail on the methodology. Detailed tables underlying the figures presented in this chapter are available in Appendix G.

### 6.1. PROGRAM COMPLETION, BY SERVICE RECEIPT

This section focuses on connections between service receipt and program completion.<sup>53</sup> **Exhibit 6-1** compares the *expected* completion rate to the *actual* completion rate for study participants who received a particular service and those who did not. The *adjusted difference* of each service on program completion is equal to the difference between actual completion rate and expected completion rate for participants who received each service, minus the difference between actual and expected completion rates for participants who did not receive each service.<sup>54</sup>

| **Receipt of accelerated and enhanced learning services is not associated with program completion.**

The first panel of **Exhibit 6-1** presents program completion rates, by receipt of accelerated and enhanced learning services; specifically, transfer credits and credits for prior learning in the military, apprenticeship programs, or other work experiences. In that panel's first row, the left part shows expected and actual completion rates, by receipt of transfer credits (received or did not receive). As shown, participants who received transfer credits had an expected completion rate of 43 percent, where the expected completion rate is predicted based on their characteristics at program entry. Their actual completion rate was slightly higher—44 percent. The excess completion rate was 1 percentage point (not shown in the exhibit). Participants who did not receive transfer credits had an expected completion rate of 54 percent, slightly higher than their actual completion rate of 53 percent, and thus an excess completion rate of -0.2 percentage points (not shown in exhibit). The adjusted difference in program completion between those who do or do not receive transfer credits is the difference between the excess completion rate for those who received transfer credits and those who did not, which is equal to 1 percentage point (after rounding). The difference is not statistically significant, suggesting that receipt of transfer credits did not have a detectable association with program completion.

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<sup>52</sup> The section on receipt of public assistance benefits also reports the adjusted differences of service receipt on poverty status.

<sup>53</sup> This section does not examine the effect of the two employment-related services on program completion, since those services should not have any direct impact on program completion.

<sup>54</sup> For details on the analytic approach and definitions of the estimates, see the box **Analytic Methods and Interpreting Adjusted Differences**; full details are available in Appendix D.

# CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

**Exhibit 6-1. Adjusted Differences in Program Completion by Service Receipt**



Source: Short-term participant follow-up survey

Note: Sample size is 2,211 survey respondents. For participants who received each service, the expected completion rate is denoted with a hollow triangle, and the actual is denoted with a solid triangle. For participants who did not receive each service, the expected completion rate is denoted with a hollow square, and the actual is denoted with a solid square. The adjusted difference is equal to the difference between actual and expected completion rates for participants who received each service, minus the difference between actual and expected completion rates for participants who did not receive each service. The adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

The second row of that first panel shows expected and actual completion rates, by receipt of credit for prior learning. The actual completion rate for participants who received credit for prior learning was lower than the expected rate by 3 percentage points (43 percent versus 40 percent). Both expected and actual completion rates for those who did not receive credit for prior learning were 52 percent. So the adjusted difference in program completion between those who do or do not receive credit for prior learning on program completion is –3 percentage points, meaning that receiving credits for prior learning appears to actually reduce the likelihood of program completion. However, as with transfer credits receipt, this difference was not statistically significant.

Thus, taking the two services of accelerated and enhanced learning together, this particular category of services did not appear to have a connection with completion rates.

### Receipt of academic advising is associated with a decrease in program completion.

The second panel of **Exhibit 6-1** presents program completion rates, by utilization of four persistence and completion services: career counseling; academic advising; financial aid advising; and training in other skills such as study skills, workplace skills, and general life skills. Only academic advising appears to be related to program completion, and the relationship is negative. That is, participants who received academic advising were *less* likely to complete their program. As shown, about 46 percent of participants who received academic advising were expected to complete their program, but only 43 percent actually did so, a difference of –3 percentage points. In contrast, those who did not receive academic advising outperformed their expected completion rate by about +3 percentage points. The difference between –3 and +3 percentage points is statistically significant. The most likely explanation for this result is “reverse causation;” that is, participants already struggling with their coursework may have been more likely to seek out academic advising than participants who were not struggling.

### Skills practice in a work-like physical environment is associated with an increase in program completion.

The third panel of **Exhibit 6-1** presents program completion rates by utilization of three types of work-based learning services: skills practice in a virtual work environment, skills practice in a work-like physical environment, and in-program work experience. Among these services, only skills practice in a work-like physical environment seemed to be related to program completion. Participants who practiced their skills in these environments exceed their expected completion rate by almost 4 percentage points whereas those who did not underperformed by 16 percentage points. What could account for this difference? One possibility is that work-based learning services sharpen the connection between coursework and actual employment. Participants who practice skills have a better understanding of how classroom concepts are applied to the “real world” and thus are more likely to complete their program.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

The combination of work-based learning and employment-related services is associated with a substantially higher completion rate.

The team also analyzed program completion rates by different combinations of services. As noted above, bundling services can produce biased estimates of the separate services in the bundle. For example, if an effective service (that is, one found to be statistically significant) is bundled with a service that has no effect, the analyses performed up to this point would find both services effective. If the bundle of services does not have a larger adjusted difference than any of its services separately, that is a sign that all the services are not separately effective and that one of them may be responsible for the effect of the others. This does not help identify which service of the group is the effective one, but it does lead to a tempered expectation of what can be achieved with a multi-service program.

To explore this possibility, the team first studied whether there were common service bundles. This research identified four clusters of participants who received distinctly different bundles of services.<sup>55</sup> **Exhibit 6-2** and **Exhibit 6-3** show how service receipt varies by cluster. **Exhibit 6-2** shows the share of participants receiving each of the 11 services by cluster. **Exhibit 6-3** summarizes receipt of services for each of the four services categories.

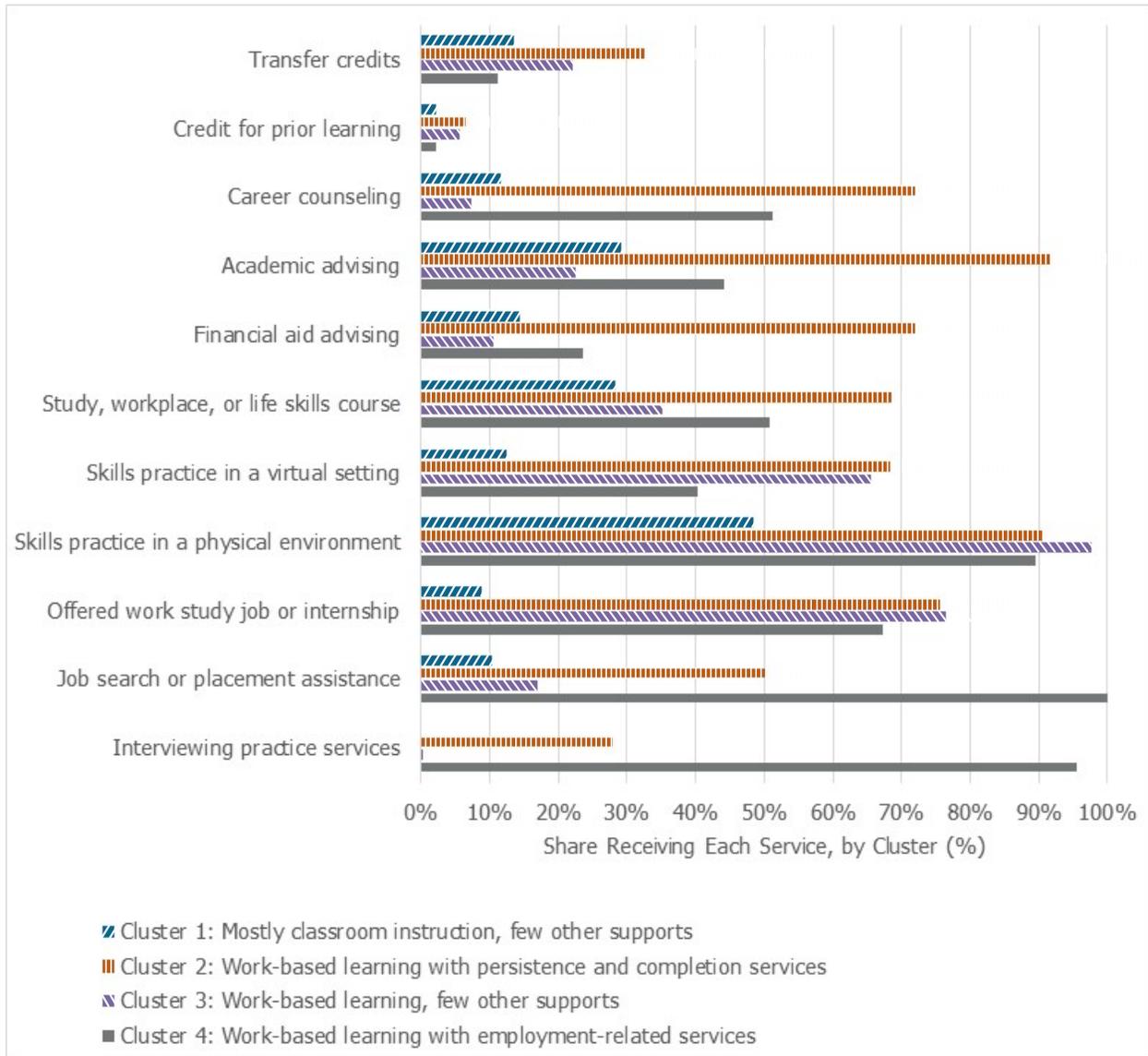
- **Cluster 1 (blue bars):** Mostly classroom instruction with few other supports. Service receipt for participants in this cluster is generally low. In fact, for eight of the 11 services, they have the lowest rates of receipt (**Exhibit 6-2**). They also have the lowest service receipt for two of the four services categories (**Exhibit 6-3**). This cluster includes 595 participants, or 27 percent of the total sample.
- **Cluster 2 (orange bars):** Work-based learning with persistence and completion services. Participants in this cluster received a mix of most of the 11 services. For seven of them (**Exhibit 6-2**) and two of the four services categories (**Exhibit 6-3**), participants have the highest utilization rates. They stand out for their use of persistence and completion services, particularly financial aid advising. This cluster includes 626 participants, or 28 percent of the total sample.
- **Cluster 3 (purple bars):** Work-based learning with few other supports. Participants in this cluster heavily used work-based learning experiences while using other services sparingly. This cluster includes 590 participants, or 27 percent of the total sample.
- **Cluster 4 (gray bars):** Work-based learning with employment-related services. Participants in this cluster used both employment-related services and work-based learning experiences at high rates. This cluster includes 400 participants, or 18 percent of the total sample.

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<sup>55</sup> Details of the analytic approach used in the cluster analysis is available in Appendix D.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

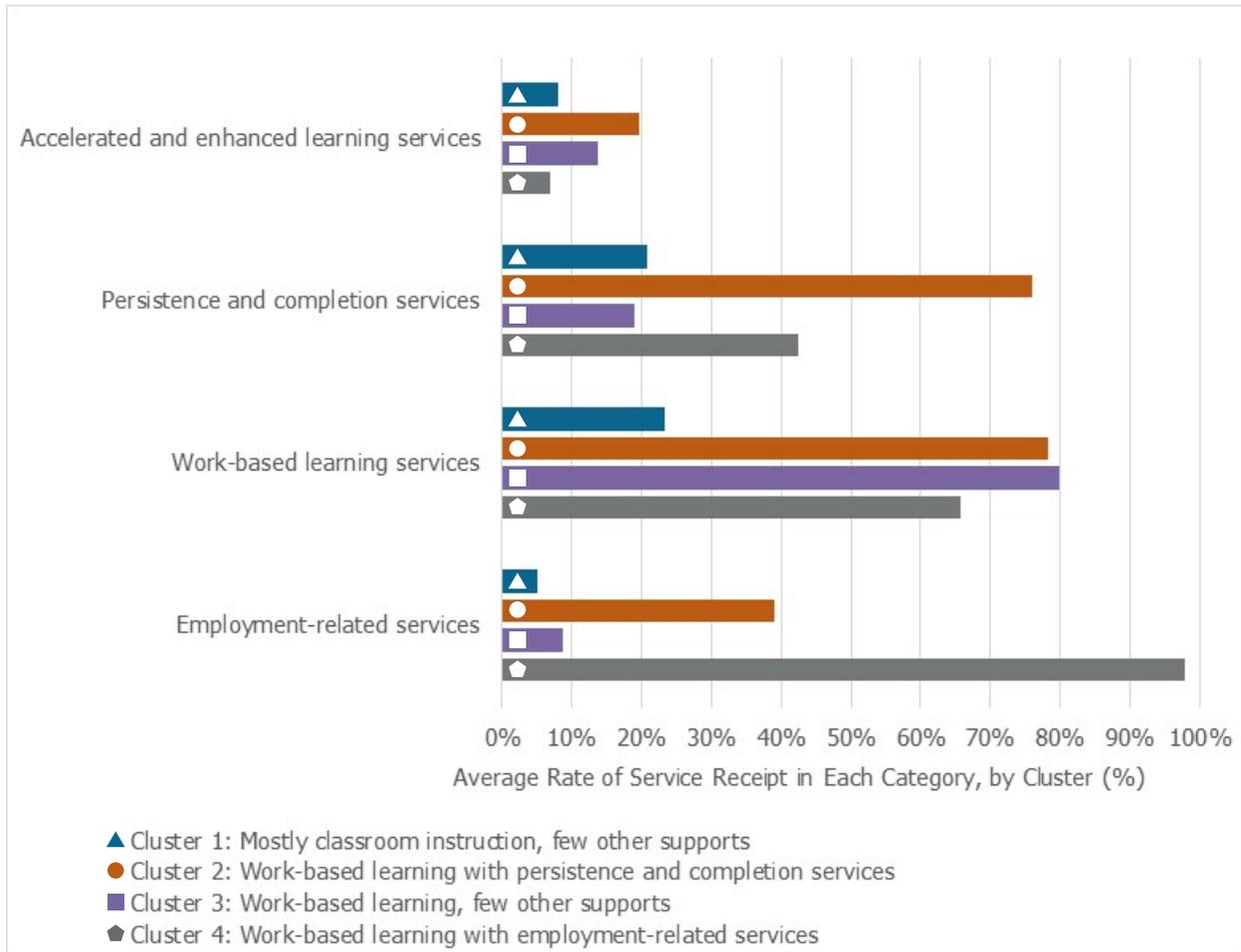
**Exhibit 6-2. Receipt of Individual Services, by Participant Cluster**



Source: Short-term participant follow-up survey  
 Note: Sample size is 2,211 survey respondents.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

**Exhibit 6-3. Receipt of Categories of Services, by Participant Cluster**



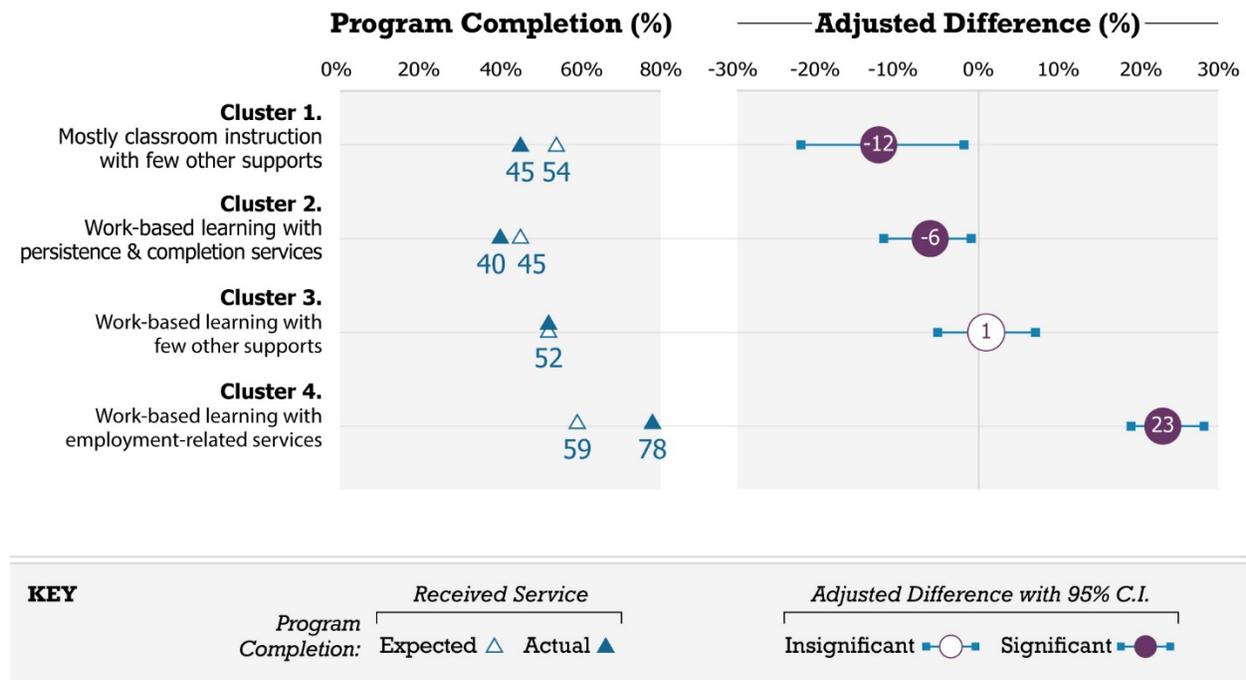
Source: Short-term participant follow-up survey

Note: Sample size is 2,211 survey respondents. "Average receipt of services in each category (%)" is the average rate of service receipt across all individual services in each services category. For example, the reported percentage for the "accelerated and enhanced learning" category is the average rate of service receipt for its two component services—transfer credits and credit for prior learning.

**Exhibit 6-4** shows that completion rates varied significantly across these four participant clusters. Participants in cluster 4—who received high levels of both work-based learning and employment-related services—dramatically outperformed their expected completion rate, with an excess completion rate of 19 percentage points. Everyone not in cluster 4 underperformed their expected completion rate by 4 points (not shown). Taking the difference between these yields an adjusted difference of 23 percentage points for the receipt of services by cluster 4 as opposed to the mixture of services received by clusters 1 through 3. That 23 percentage points is a substantial adjusted difference. It is unclear why participants who received that particular bundle of work-based learning services and employment-related services have such a high completion rate. A possible explanation is that work-based learning and employment-related services make the connection between the training program and actual employment clearer. That cluster 1, which includes few services above and beyond classroom training, has a negative and significant association with program completion lends credence to this theory.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

**Exhibit 6-4. Connections of Different Service Bundles with Program Completion**



Source: Short-term participant follow-up survey

Note: Sample size is 2,211 survey respondents. For participants in each service cluster, the expected completion rate is denoted with a hollow triangle, and the actual is denoted with a solid triangle. The adjusted difference is equal to the difference between actual and expected completion rates for participants in each service cluster, minus the difference between actual and expected completion rates for participants not in that cluster (i.e., those in any of the other three clusters). Adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

### 6.2. TRAINING-RELATED EMPLOYMENT, BY SERVICE RECEIPT

This section focuses on how service receipt might be connected to success in obtaining training-related employment. All statistics in this section pertain only to participants who either finished their required classes or left without finishing, and thus excludes participants still enrolled in training at the time of follow-up.<sup>56</sup> Exhibit 6-5 shows the *expected* training-related employment rate, *actual* training-related employment rate, and *adjusted difference* for each of the 11 different services. As discussed in prior chapters, participants who finished their classes were much more likely than participants who left without finishing to have obtained training-related employment, so any variation in this outcome across subgroups may be partially due to differences in enrollment status. This chapter does not explore variation in training-related employment separately by enrollment status.

<sup>56</sup> As noted in prior chapters, the survey instrument did not ask about training-related employment for those still in their initial programs.

### Receipt of transfer credits is associated with higher rates of training-related employment.

The first panel of **Exhibit 6-5** presents evidence about connections of accelerated and enhanced learning services with participants' training-related employment after completing the program. The results indicate that transfer credits receipt increased the rate of training-related employment. Participants who received transfer credits had a 7 percentage point increase (difference between actual and expected rates) in training-related employment, whereas those who did not receive transfer credits had a 2 percentage point decrease. The adjusted difference of 8 percentage points is statistically significant. There was no detectable association of receipt of credit for prior learning with training-related employment.

### Receipt of financial aid advising is associated with higher rates of training-related employment.

The second panel of **Exhibit 6-5** presents evidence about connections of four persistence and completion services with training-related employment. Only one, financial aid advising, appears to have a significant association with training-related employment, increasing it by 6 percentage points. It is not clear why only this service has an association. It is possible that participants who received financial aid advising also received better advising about which training would be more likely to lead to training-related employment.

### Receipt of work-based learning is associated with higher rates of training-related employment.

The third panel of **Exhibit 6-5** presents evidence of connections of work-based learning with training-related employment. All three types of work-based learning opportunities have positive and statistically significant associations with participants' rates of training-related employment after finishing or stopping the program. Participation in work-based learning opportunities situated in physical environments had the largest adjusted difference: 15 percentage points.

### Receipt of employment-related services is associated with higher rates of training-related employment.

The fourth panel of **Exhibit 6-5** presents evidence of connections of two employment-related services with training-related employment: job search or placement assistance and interviewing practice. Both service types are associated with positive and statistically significant increases in participants' rates of training-related employment after completing the program. Participants who received each type of service were more than 17 percentage points more likely be employed in a job related to their training than were participants who did not receive the services. The similarity of the adjusted differences in outcomes between those receiving and not receiving each of the two services raises the question of whether they work separately or in tandem with each other.

# CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

**Exhibit 6-5. Adjusted Differences in Training-Related Employment by Service Receipt**



Source: Short-term participant follow-up survey

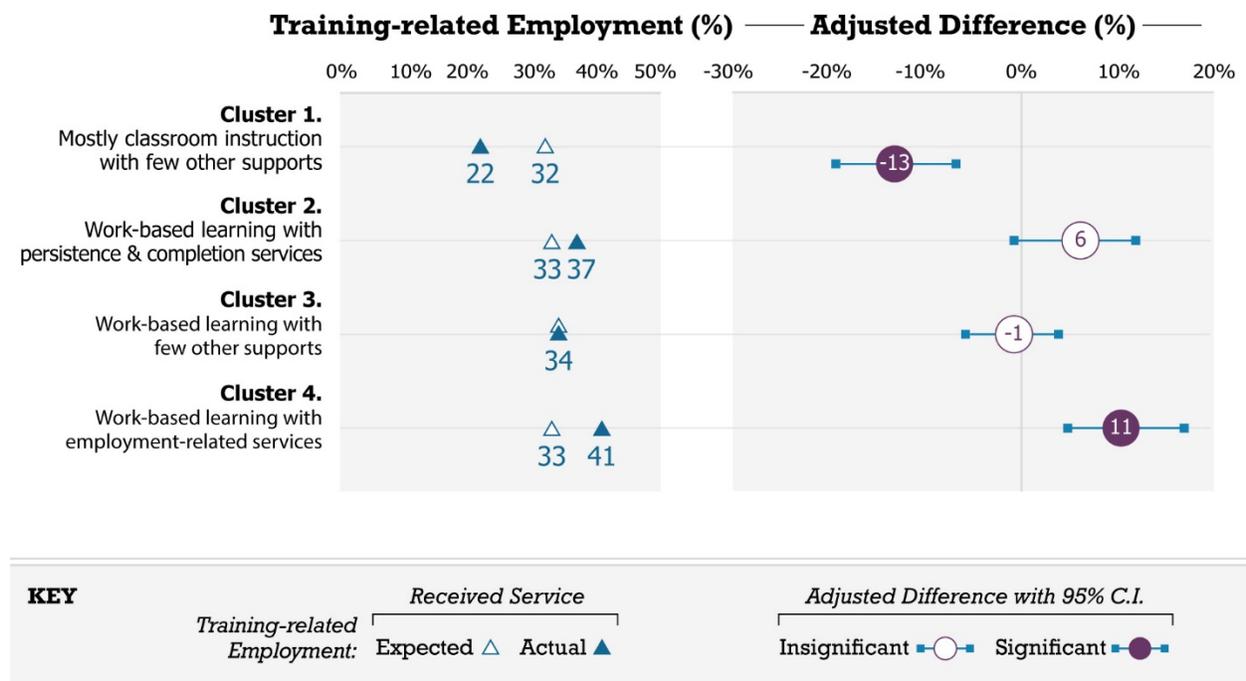
Note: Sample size is 1,834 survey respondents who had finished classes or left without finishing by about 15 months after program entry. For participants who received each service, the expected training-related employment rate is denoted with a hollow triangle, and the actual is denoted with a solid triangle. For participants who did not receive each service, the expected training-related employment rate is denoted with a hollow square, and the actual is denoted with a solid square. The adjusted difference is equal to the difference between actual and expected employment rates for participants who received each service, minus the difference between actual and expected employment rates for participants who did not receive each service. The adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

The combination of work-based learning and employment-related services is associated with higher rates of training-related employment.

**Exhibit 6-6** examines the effect of receiving different bundles of services on the likelihood of training-related employment.<sup>57</sup> The bundle provided to cluster 1—mostly classroom instruction with few other supports—had a significant and negative association with training-related employment (as opposed to the bundle of services provided to clusters 2 through 4). Meantime, the bundle of services provided to cluster 4—which had high rates of both work-based learning and employment-related services—had a significant and positive association with training-related employment (as opposed to the bundle of services provided to clusters 1 through 3). This is similar to the results for program completion, which found that the combination of work-based learning and employment-related services is associated with a higher rate of program completion.

**Exhibit 6-6. Connections of Different Service Bundles with Training-Related Employment**



Source: Short-term participant follow-up survey

Note: Sample size is 1,834 survey respondents who had finished classes or left without finishing by about 15 months after program entry. For participants in each service cluster, the expected training-related employment rate is denoted with a hollow triangle, and the actual is denoted with a solid triangle. The adjusted difference is equal to the difference between actual and expected training-related employment rates for participants in each service cluster, minus the difference between actual and expected training-related employment rates for participants not in that cluster (i.e., those in any of the other three clusters). The adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

<sup>57</sup> For the definitions of each of the four clusters, see the discussion introducing Exhibits 6-2 and 6-3 in Section 6.1.

### 6.3. CHANGE IN EARNINGS, BY SERVICE RECEIPT

This section reports connections of service receipt with change in earnings between the third quarter before program entry and the fifth quarter after program entry. Similar to the previous section, the sample is restricted to those not still enrolled in their initial training program at survey follow-up.

**Exhibit 6-7** shows the association of each of the 11 services with change in earnings for this set of participants.

| **Receipt of transfer credits is associated with a larger increase in earnings.**

The first panel of **Exhibit 6-7** shows that among participants who were not still enrolled in training at follow-up, those who received transfer credits outperformed their expected change in earnings by +\$1,104 (\$3,538 actual versus \$2,434 expected). Participants who did not receive transfer credits earned \$122 less than their expected change in earnings at program entry (\$1,815 actual versus \$1,937 expected). Thus, transfer credits have an estimated statistically significant adjusted difference of \$1,226. Receipt of credit for prior learning did not have an association with earnings growth.

| **Receipt of persistence and completion services is not associated with the change in earnings.**

The second panel of **Exhibit 6-7** shows the estimated associations of four persistence and completion services with change in earnings. None of the services shows a significant adjusted difference. Although the prior section showed a positive adjusted difference of financial aid advising on training-related employment, that service is not significantly associated with change in earnings.

| **Participation in virtual work-based learning opportunities is associated with a larger increase in earnings.**

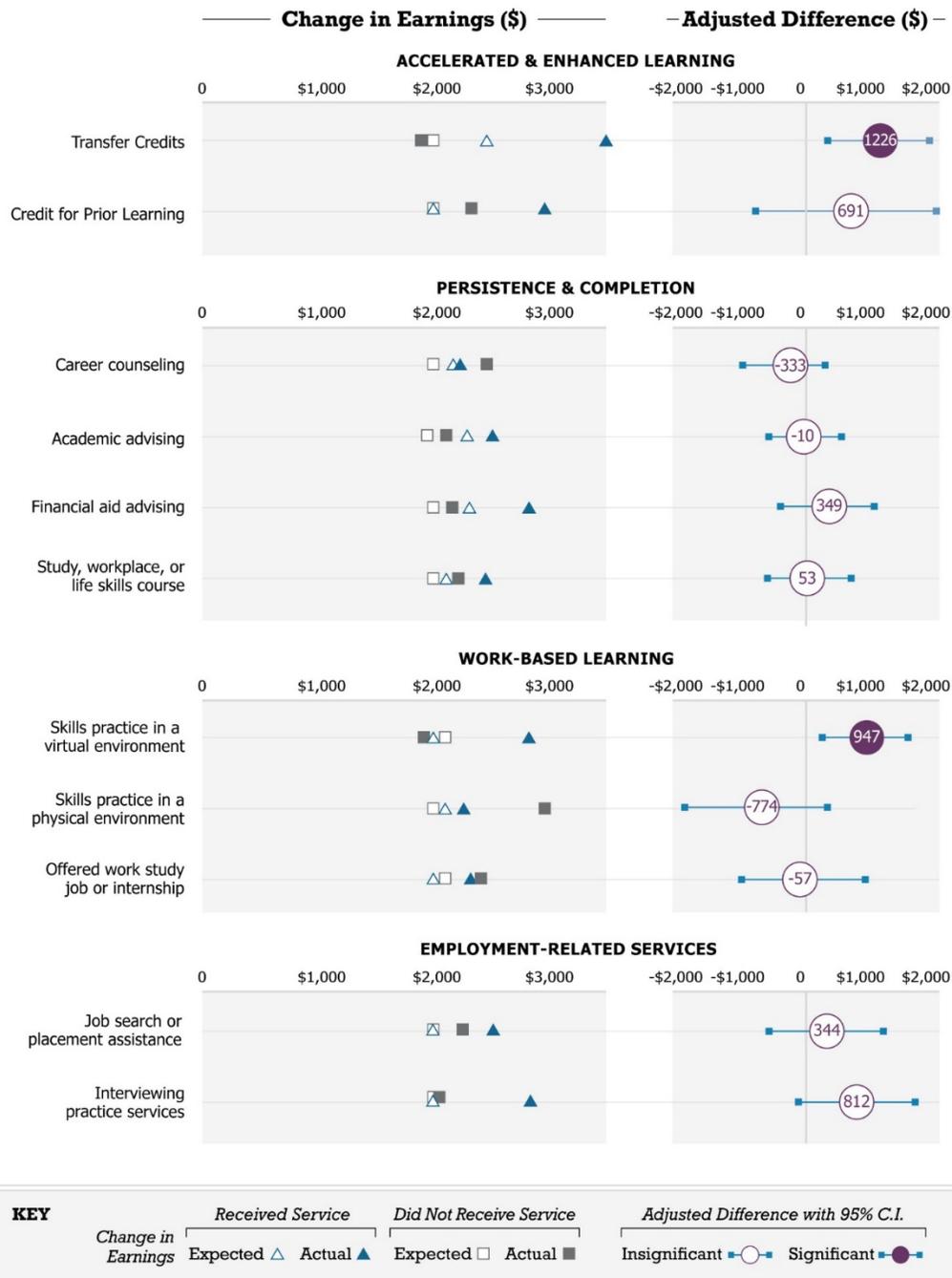
The third panel of **Exhibit 6-7** shows the association of work-based learning services with change in earnings. Participation in virtual work-based learning opportunities is associated with a statistically significant increase in earnings of +\$947. There was no association for participation in work-like physical environments or opportunities for direct work experience.

| **Receipt of employment-related services was not associated with the change in earnings.**

The fourth panel **Exhibit 6-7** shows the association of two employment-related services with change in earnings. Neither job search or placement assistance nor interviewing practice was associated with the change in earnings.

# CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

**Exhibit 6-7. Connections of Service Receipt with Change in Earnings**



Source: Short-term participant follow-up survey

Note: Sample size is 1,571 survey respondents who had finished classes or left without finishing by about 15 months after program entry and had sufficient information at program entry for matching to NDNH wage records. For participants who received each service, the expected change in earnings is denoted with a hollow triangle, and the actual is denoted with a solid triangle. For participants who did not receive each service, the expected change in earnings is denoted with a hollow square, and the actual is denoted with a solid square. The adjusted difference is equal to the difference between actual and expected change in earnings for participants who received each service, minus the difference between actual and expected change in earnings for participants who did not receive each service. The adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

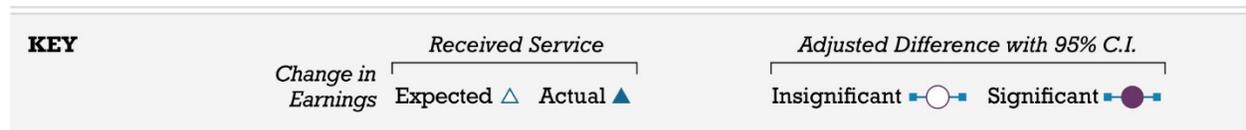
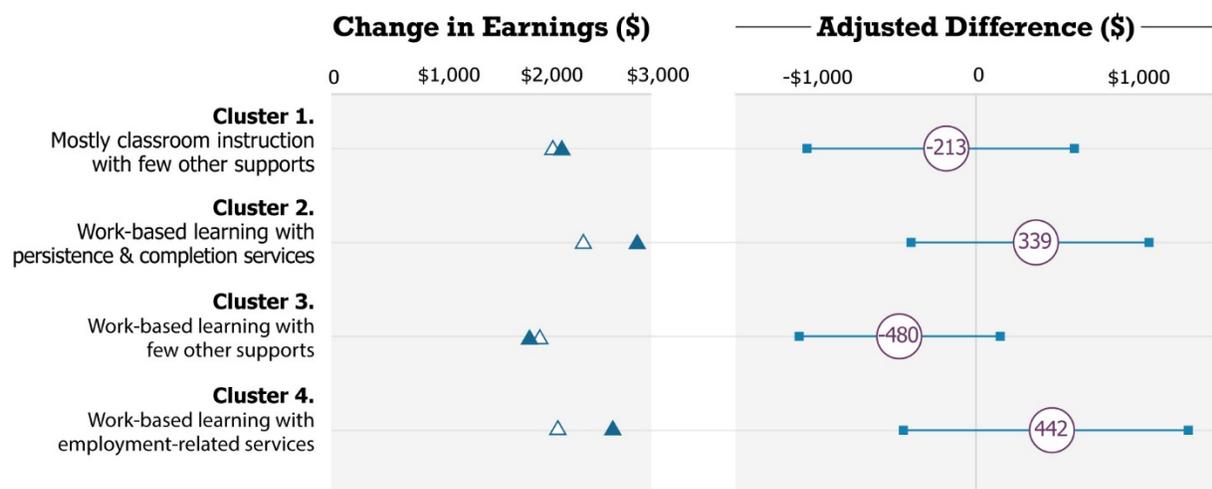
## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

No bundle of service receipt is associated with the change in earnings.

**Exhibit 6-8** examines the effect of receiving the four bundles of services on change in earnings.<sup>58</sup> There were no significant adjusted differences for any of the four clusters of participants. This differs from the results for program completion and training-related employment, on which the services that cluster 4 received (high rates of both work-based learning and employment-related services) had large and positive adjusted differences.

Taken together, there is little evidence that receipt of various bundles of services is associated with positive change in earnings. Only receipt of transfer credits and skills practice in a virtual environment were associated with earnings increases.

**Exhibit 6-8. Connections of Different Service Bundles with Change in Earnings**



Source: Short-term participant follow-up survey

Note: Sample size is 1,571 survey respondents who had finished classes or left without finishing by about 15 months after program entry and had sufficient information at program entry for matching to NDNH wage records. For participants in each service cluster, the expected change in earnings is denoted with a hollow triangle, and the actual is denoted with a solid triangle. The adjusted difference is equal to the difference between actual and expected change in earnings for participants in each service cluster, minus the difference between actual and expected change in earnings for participants not in that cluster (i.e., those in any of the other three clusters). The adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

<sup>58</sup> For the definitions of each of the four clusters, see the discussion introducing Exhibits 6-2 and 6-3 in Section 6.1.

## 6.4. PUBLIC ASSISTANCE BENEFIT RECEIPT, BY SERVICE RECEIPT

This section examines how service receipt might be connected to receipt of public assistance benefits. The TAACCCT theory of change (Chapter 2) suggests that completing the offered trainings should lead to higher earnings and indirectly to lower receipt of public assistance benefits. The analysis includes all short-term participant follow-up survey respondents.

The findings for public assistance benefit receipt are rather surprising: receipt of many TAACCCT services is associated with statistically significant increases in public assistance benefit receipt (**Exhibit 6-9**). This result does not appear to be due to challenges in the study predicting public assistance benefit receipt; in fact, the research team predicted benefit receipt at follow-up from variables measured at program entry well.<sup>59</sup> Moreover, an exploratory analysis of connections of service receipt with poverty level found no significant association, suggesting that the apparent association with public assistance benefit receipt is not a response to any increase in poverty among participants.<sup>60</sup>

Receipt of credit for prior learning is associated with higher receipt of public assistance benefits.

The first panel of **Exhibit 6-9** suggests that one accelerated and enhanced learning service increased participants' public assistance benefits receipt. Participants who received credit for prior learning were significantly more likely to receive public assistance at follow-up than participants who did not, with an estimated adjusted difference of 11 percentage points. There was no significant difference in public assistance benefit receipt based on receipt of transfer credits.

Receipt of career counseling, academic advising, and financial aid are all associated with higher receipt of public assistance benefits.

The second panel of **Exhibit 6-9** examines the possible connections of persistence and completion services with public assistance benefit receipt. Participants who received career counseling, academic advising, or financial aid advising were more likely to receive public assistance benefits compared to the expected rates at program entry. Participants who did not receive those services had lower rates of public assistance benefit receipt compared to the expected rates at program entry. Those adjusted differences are statistically significant and range from 5 to 7 percentage points. Given the lack of an association of career counseling, academic advising, or financial advising with poverty levels, as noted above, it seems plausible that these services are bundled with services that inform participants of their eligibility for public assistance programs.

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<sup>59</sup> The R-squared coefficient of the team's prediction model was 19 percent, a very high level for a binary outcome. Some of the important predictors at program entry of receipt of public assistance benefits at follow-up included SNAP receipt, TRA receipt, living rent free, prior education, family income, employment status, expected work hours during training, and citizenship. Program duration also affected receipt—participants in longer programs were more likely to be receiving public assistance at the time of the short-term follow-up survey. The team controlled on program duration in the same manner as those other characteristics.

<sup>60</sup> See Appendix G for detailed tables on the adjusted differences in public assistance benefit receipt and poverty by service receipt.

# CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

**Exhibit 6-9. Adjusted Differences in Receipt of Public Assistance Benefits by Service Receipt**



Source: Short-term participant follow-up survey

Note: Sample size is 2,211 survey respondents. For participants who received each service, the expected receipt of public assistance benefits is denoted with a hollow triangle, and the actual is denoted with a solid triangle. For participants who did not receive each service, the expected receipt of public assistance benefits is denoted with a hollow square, and the actual is denoted with a solid square. The adjusted difference is equal to the difference between actual and expected receipt of public assistance benefits for participants who received each service, minus the difference between actual and expected receipt of public assistance benefits for participants who did not receive each service. The adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

| Being offered a work study job or internship is associated with higher receipt of public assistance benefits.

The third panel of **Exhibit 6-9** shows that participants who had the opportunity to participate in a work-study job or internship while in training were more likely to receive public assistance benefits at follow-up than at program entry by +2 percentage points. In contrast, participants who did not interact with employers experienced a reduction in public assistance benefits receipt by –2 percentage points. The estimated adjusted difference of 4 percentage points is statistically significant. It is unclear why there is an impact of this service on public assistance benefit receipt.

| Receipt of employment-related services is not associated with higher receipt of public assistance benefits.

The fourth panel of **Exhibit 6-9** shows that there is no significant relationship between receipt of employment-related services and receipt of public assistance benefits. Neither expected nor actual participation rates varied much by receipt of either job search or placement assistance or interviewing practice.

| Receipt of few services across all four services categories is associated with lower rates of public assistance benefit receipt.

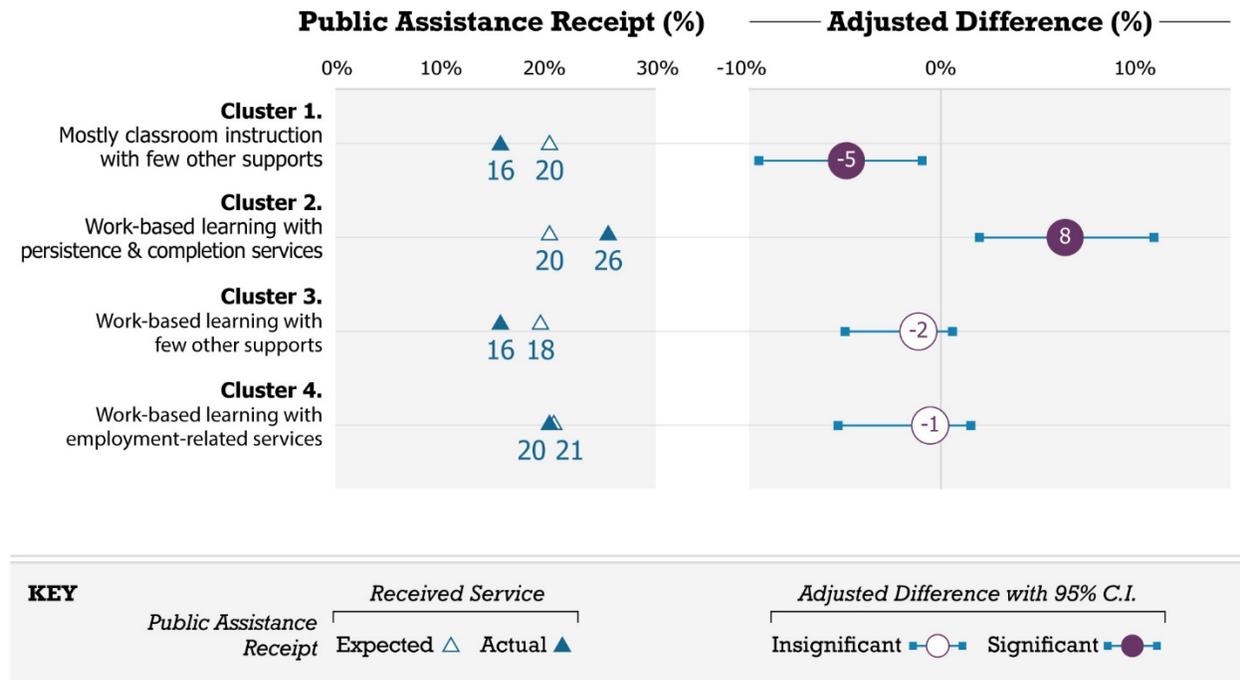
**Exhibit 6-10** examines possible connections of different bundles of services with receipt of public assistance benefits.<sup>61</sup> As shown, public assistance benefit receipt was lower than the expected rate only for participants in cluster 1. Recall that the participants in cluster 1 received occupational training and little else. Being in cluster 1 reduced public assistance benefit receipt by –5 percentage points. In contrast, participants in cluster 2, where participants received an array of work-based learning opportunities and persistence and completion services, were +8 percentage points more likely to receive public assistance benefits at follow-up. Participation in the other two clusters did not appear to be associated with public assistance benefits receipt.

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<sup>61</sup> For the definitions of each of the four clusters, see the discussion introducing Exhibits 6-2 and 6-3 in Section 6.1.

## CHAPTER 6: PARTICIPANT OUTCOMES, BY SERVICE RECEIPT

**Exhibit 6-10. Connections of Different Service Bundles with Receipt of Public Assistance Benefits**



Source: Short-term participant follow-up survey

Note: Sample size is 2,211 survey respondents. For participants in each service cluster, the expected receipt of benefits is denoted with a hollow triangle, and the actual is denoted with a solid triangle. The adjusted difference is equal to the difference between actual and expected receipt of public assistance benefits for participants in each service cluster, minus the difference between actual and expected receipt of public assistance benefits for participants not in that cluster (i.e., those in any of the other three clusters). The adjusted differences are denoted with circles; bounds of 95 percent confidence interval are denoted with squares. Statistically significant adjusted differences are denoted with dark purple circles; insignificant adjusted differences are denoted with light purple circles. Expanded results are reported in Appendix G.

# 7. Projected Participant Outcomes for Future Cohorts, by Program

Chapters 4 and 5 focused on outcomes for the full sample of study participants as well as for subgroups of participants. Chapter 6 focused on the ways in which supportive services can affect participant outcomes. This chapter shifts the focus to outcomes for the 34 programs. It addresses the following research question:

*How do success rates (program completion, training-related employment, change in earnings, and public assistance benefits receipt) vary across programs and grantees?*

Exhibits in this chapter show the rankings of the 34 programs relative to one another. When interpreting these findings, it is important to keep in mind the rankings are not corrected for participant characteristics at program entry or for local labor market conditions over the follow-up period. A high score could indicate the program attracted better prepared participants, did a better job of training participants, or trained participants for occupations in high demand at the time of follow-up. Thus, the rankings are most likely due to a complex set of factors. As such, this chapter primarily presents the rankings with limited speculation about causes.

Second, there are many ties and near-ties in the rankings, and some of the program sample sizes are very small. Therefore, it is not clear how the rankings would look if all programs scaled up. Because of the small sample sizes at most programs, the estimates presented are not simple averages of outcomes for the study period, but are projections of outcomes that future cohorts might

experience at these programs assuming program features, the local labor market, and the participant profile are the same as in 2017-2019. The methods used for this report are standard in fields where ranking of individual entities is important, such as player selection in professional sports, hospital quality, and allocation of need-driven federal education aid. These methods discount exceptional performance

### Warning

The analysis methods in this chapter make strong assumptions. Reader caution is advised.

### Key Takeaways: Participant Outcomes at Individual Programs on

- IT programs at Ivy Tech Community College of Indiana have low completion rates and low rates of training-related employment but strong earnings growth once students finish or leave the program.
- The shortest programs like the Commercial Driver's License and Forklift program at Cincinnati State Technical and Community College and the Core Plus program at Delgado Community College have high completion rates but low earnings growth.
- The LPN program at Washburn University of Topeka has a high completion rate, the highest rate of training-related employment and strongest earnings growth.
- The Mechatronics and Machining programs at South Central College have low completion rates but average or higher rates of training-related employment coupled with strong earnings growth.
- Welding programs at several grantees have above average earnings growth.
- Programs at Chafee Community College tend to have below average earnings growth.

(both good and bad) and assume that future performance for these entities will be closer to average, particularly if measured performance is based on small sample sizes. See Appendix E for a detailed description of these methods as well as comparisons of these projections with simple local mean outcomes.

### Interpreting Exhibits in Chapter 7

In this chapter's exhibits, each result is shown using a circle, a thick red bar, and a thin green bar.

The **circle represents the point estimate**—that is, the average predicted outcome for future participant cohorts in that particular program. An example is:

About a year after program entry, 52 percent of future participants at the machining program at South Central College who are not still enrolled in their training program are predicted to be employed in jobs closely related to that training.

This is not an estimate of training-related employment for the participants in the study sample who responded to the follow-up survey. Rather, it is an estimate of the inherent rate that future cohorts of participants with demographic and economic characteristics similar to this study's participants will experience (assuming program administration remains constant and the job market conditions remain similar). The Bayesian estimation procedure discounts both extremely high and extremely low rates across the program, under the assumption that these are chance blips, unlikely to be repeated, and it "pulls" these extreme estimates toward the center.

The **thin blue bar shows what is possible** given the local program's design, the characteristics of the participants enrolled, its faculty, and the local economic conditions of 2017-2019. Continuing with the South Central College example,

The possible range of completers employed in jobs closely related to their training is 15 percent to 89. There is a 99.9 percent chance that the true training-related employment rate is within this range.

The **thick orange bar shows the likely range** and is akin to the confidence interval graphics used in Chapters 5 and 6. This bar is the 80 percent credible interval. For the South Central College machining program,

The estimate for training-related employment runs from 35 to 69 percent. This is the shortest interval that has an 80 percent probability of containing the true rate for future cohorts of participants under the same assumptions noted above. Nonetheless, there is a 10 percent probability that the true rate is smaller than 35 percent, and a 10 percent probability that the true rate is larger than 69 percent.

For more details on the Bayesian method see Appendix E.

This chapter, as with other chapters, includes graphics that present both point estimates and intervals around these point estimates that indicate the precision of the estimate. However, the statistical approach to constructing these intervals is very different than in prior chapters. The intervals in prior chapters were confidence intervals; the intervals in this chapter are "credible intervals." Confidence intervals reflect hypothetical repetitions of the data collection; in Chapters 5 and 6, they were constructed such that if the data collection were repeated many times, in 95 percent of cases the computed

confidence interval would contain the true value of the outcome. In contrast, credible intervals take into account a prior “belief” about the true outcome level.<sup>62</sup> A credible interval on the best estimate for a specific program reflects the best judgment of authors about the amount of uncertainty in the predicted average experience of future cohorts of participants in a program, assuming no changes in program design, staff quality at the program, average skills and interests of new cohorts admitted to the program, and local economic conditions for graduates. Both 80 and 99.9 percent credible intervals are shown.

Although the research team generally prefers confidence intervals, the technical challenges in producing them are much greater for program estimates than for the types of statistics presented in the prior chapters, so credible intervals are reported in Chapter 7.<sup>63</sup>

### 7.1. PROGRAM COMPLETION

**Exhibit 7-1** shows program completion for the 34 programs in the outcomes study based on responses to the short-term participant follow-up survey. As discussed in earlier chapters, program completion means both finishing required classes and earning an associated credential.

| **The commercial driver’s license and forklift programs had the highest rates of program completion.**

As shown, the research team projects the commercial driver’s license and forklift programs at Cincinnati State Technical and Community College to have the highest completion rate (93 percent). The orange and blue intervals are tight, indicating that there is an 80 percent probability that the true completion rate is between 90 and 96 percent, and a 99.9 percent probability that it is between 82 and 99 percent. The short average duration of one week for these programs is likely an important driver of the high completion rates.

| **Health care programs, some welding programs, and manufacturing programs also had high completion rates.**

The Washburn University consortium’s licensed practical nurse program, for example, had an estimated completion rate of almost 80 percent, and the 80-percent plausible completion range is 73 to 85 percent. The other programs in the Washburn University consortium had completion rates that also were high (74 percent). The Chaffey College mechanical craft program had a similar estimated completion rate (79 percent), but a larger plausible range, due mostly to a smaller number of program participants. Perhaps the career navigators in the Washburn University consortium provided important services that assisted participants to persist in and complete their training programs.

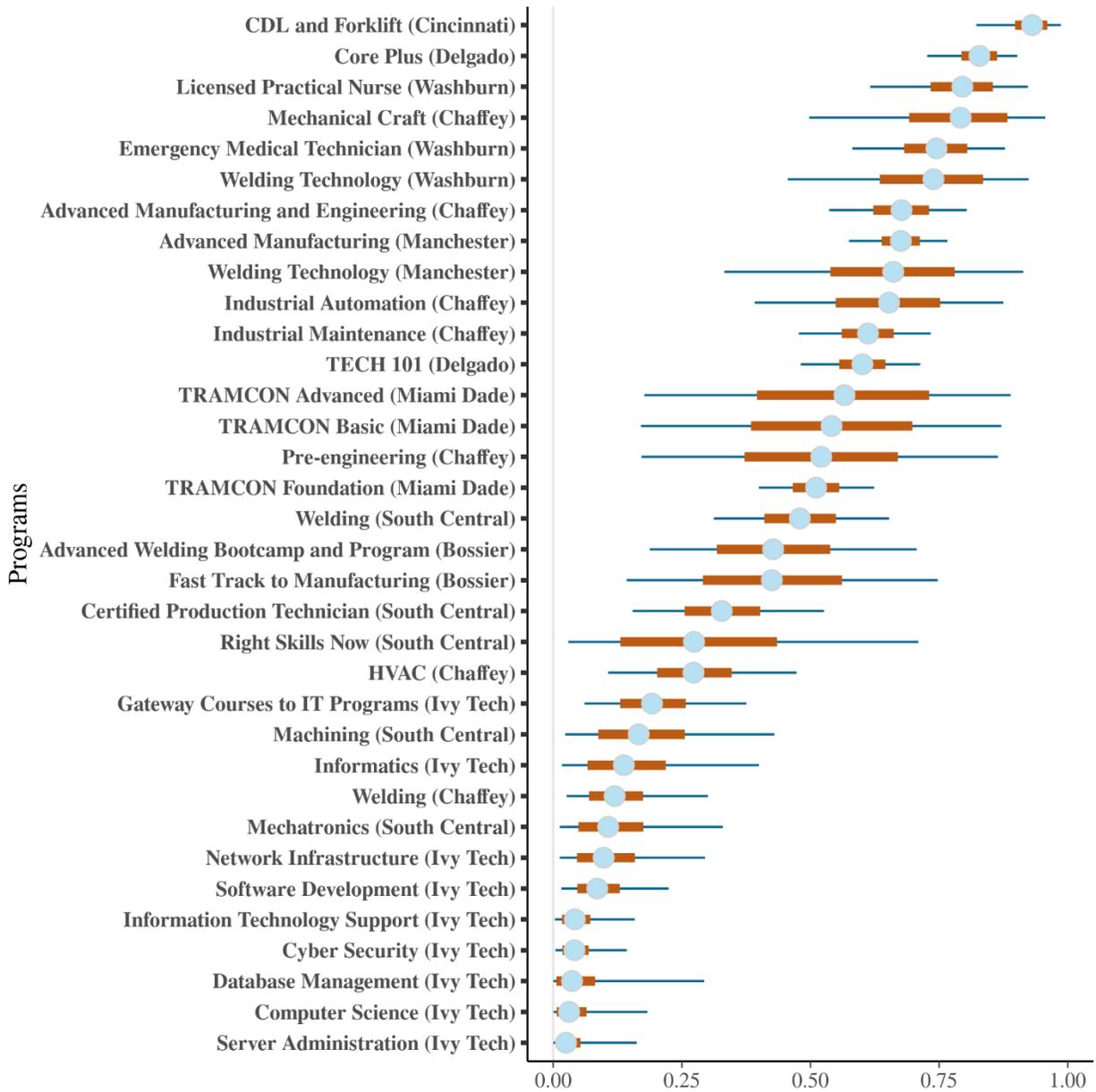
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<sup>62</sup> The philosophy behind confidence intervals is known as “frequentist inference.” The one behind credible intervals is known as “Bayesian inference.”

<sup>63</sup> There are different traditions with each philosophy about how much confidence/credibility should be built into the intervals. Confidence intervals are usually built to contain 95 percent confidence, and that is the tradition the research team followed in prior chapters. The software used for credible intervals has defaults of 80 and 99.9 percent credibility, which the research team used in this chapter.

# CHAPTER 7: PARTICIPANT OUTCOMES, BY PROGRAM

**Exhibit 7-1. Projected Program Completion Rates for Future Cohorts, by Program**



Source: Short-term participant follow-up survey

Note: Sample is 2,211 survey respondents. Program completion means finishing the required classes and earning an associated credential. Circle marks projected completion rate for future cohorts at the program. Thin blue line traces 99.9 percent credible interval. Thick orange line traces 80.0 percent credible interval.

Among the 34 programs, information technology programs had the lowest rates of program completion. This was likely due to these programs' long durations.

At the other end of the spectrum, the Ivy Tech Community College IT-related programs had the lowest completion rates, ranging from 2 percent for server administration to 10 percent for network infrastructure. The orange bars for the five lowest-ranked programs (all Ivy Tech Community College) barely extend beyond the circle marking the point estimate, indicating there is an 80 percent probability that each of those programs had very low completion rates within the follow-up period. Even if one considers 99.9 percent credible intervals, it is extremely unlikely that four of these programs have completion rates greater than 20 percent.

What might account for the low completion rates of those IT programs at Ivy Tech Community College? Its eight programs included in the outcomes study were the longest in the study, with some lasting almost two years. As noted in Chapter 2, most follow-up survey interviews occurred between 12 and 15 months after program entry—too soon for participants to have completed these trainings. The server administration program was one of the longer ones (21 months); the network infrastructure program was the shortest at the college (14 months), but still considerably longer than other programs in the study. The outcomes study also included two short (four months) Ivy Tech Community College gateway classes to its IT programs; most of the college's study participants began in one of these classes. Based on the change in earnings impact of all of these IT programs, discussed below in Section 7.3, it appears that program completion may not be a requirement for positive earnings gains. In addition to having some of the longest programs in the outcomes study, many Ivy Tech Community College classes were offered partly or wholly online. Completion rates in online classes tend to be substantially lower than in-person classes.

## 7.2. TRAINING-RELATED EMPLOYMENT

**Exhibit 7-2** shows rates of employment in a training-related occupation for participants in the 34 programs selected for the outcomes study. The analysis is restricted to study participants who were no longer enrolled at follow-up because they had either finished the required classes or left without finishing.

The licensed practical nurse and a welding technology program had the highest rates of training-related employment.

As shown, the Washburn University licensed practical nurse program had the highest rate of training-related employment, with an estimated average of 84 percent. Moreover, the plausible ranges for the program are relatively small, suggesting that future cohorts would have a similar training-related employment rate.

Exhibit 7-2. Projected Training-related Employment Rates for Future Cohorts, by Program



Source: Short-term participant follow-up survey

Note: Sample is 1,834 survey respondents who had finished classes or left without finishing by about 15 months after program entry. Circle marks projected completion rate for future cohorts at the program. Thin blue line traces 99.9 percent credible interval. Thick orange line traces 80.0 percent credible interval.

The welding technology program at Washburn University had the next highest training-related employment rate (57 percent). Unlike the licensed practical nurse program, the welding technology program's 80-percent plausible range for future cohorts is wide, ranging from 45 to 68 percent. As noted above, the welding program had a completion rate of 74 percent, one of the highest observed. It is unclear why its training-related employment rate is lower than its completion rate. The implementation study reported that welding positions in the gas industry (e.g., repairing pipelines) had been expected to be in high demand but were not, affected by a slowdown in the gas and oil industry. Although Washburn University encouraged completers to explore other industries in the area or work out of state, it appears that many participants did not obtain welding-related jobs.

**IT programs other than the gateway classes had the lowest training-related employment rates.**

The rates of training-related employment for these programs ranged from 6 percent in computer science to 12 percent in network infrastructure. The 80 percent credible intervals for these programs range from lower bounds of 0 percent (computer science, database management, informatics) to upper bounds of 22 percent (server administration). The low training-related employment rates are perhaps not surprising, given the low program completion rates, possibly due to the longer length of the programs. Given IT participants' higher-than-average earnings, as described in the next section, it is possible that these participants were working in the IT field, but in an occupation that was only somewhat related, rather than closely related to their training program.

**Only three other programs had estimated training-related employment rates higher than 50 percent.**

These included the Manchester Community College consortium's advanced manufacturing program, the Chaffey College consortium's mechanical craft program, and the South Central College consortium's machining program. The completion rate for these programs ranged from a high of 79 percent for mechanical craft to about 66 percent for advanced manufacturing to a low of 17 percent for machining. Looking more closely at the South Central College machining program, its training-related employment rate is higher than its completion rate. It is possible that participants earned in-demand skills in the program and were hired prior to completing it.

**The programs with the highest completion rates had only average estimated training-related employment rates.**

The estimated training-related employment rate for the Cincinnati State Technical and Community College programs—27 percent—could reflect that few jobs were available in the area. Or the programs may not have prepared participants for the jobs in demand locally. The Delgado Community College Core Plus program resulted in a National Center for Construction Education & Research Core credential and the U.S. Occupational Safety and Health Administration (OSHA)'s OSHA 10 credential, which may not have been aligned with jobs in the local economy.

### 7.3. CHANGE IN EARNINGS

Exhibit 7-3 shows change in earnings for study participants no longer enrolled in their program. The change in earnings measure assesses a two-year period: three quarters prior to program entry plus five quarters after program entry.

**Exhibit 7-3. Projected Two-Year Changes in Earnings for Future Cohorts, by Program**



Source: National Directory of New Hires

Note: Sample size is 1,571 survey respondents who had finished classes or left without finishing by about 15 months after program entry and had sufficient information at program entry for matching to NDNH wage records. Study period covers the three quarters before program entry through the five quarters after it. Circle marks projected change in earnings for future cohorts at the program. Thin blue line traces 99.9 percent credible interval. Thick orange line traces 80.0 percent credible interval.

| **Of the 11 programs with the most positive change in quarterly earnings, seven were Ivy Tech Community College IT programs.**

The Ivy Tech Community College programs increased earnings between \$3,040 and \$5,066 per quarter depending on the program. This finding was surprising, given their low levels of program completion and training-related employment. It suggests that program participants are finding employment, possibly in the IT industry, but not specific to their training. Two programs at the South Central College consortium and two at the Washburn University consortium also produced very positive changes in earnings. Program participants in the mechatronics program at South Central College could expect earnings to increase \$4,380 per quarter, and those in the machining program, \$3,612. Program participants in the welding technology program at the Washburn University consortium could expect an increase in earnings of \$3,420 per quarter, and those in the licensed practical nurse program, \$3,239.

| **Among participants with the lowest estimated change in earnings were those who attended construction programs, certain manufacturing programs, and the commercial driver's license and forklift programs.**

The Core Plus program at Delgado Community College produced the lowest change in earning, \$422 per quarter. As noted above, its credentials may not have prepared recipients for jobs in the local economy. Delgado Community College's TECH 101 program had a positive change in earnings of \$856 per quarter. This program also resulted in National Center for Construction Education & Research Core and OSHA 10 credentials. Again, it is possible the credentials had limited labor market value in the New Orleans region. The commercial driver's license and forklift program at Cincinnati State Technical and Community College each yielded \$665 per quarter.

The Miami Dade College Training for Manufactured Construction (TRAMCON) foundation and basic programs were associated with positive changes in earnings of \$683 and \$1,088 per quarter, respectively. The foundation program was the first of a series of four TRAMCON programs, each associated with a credential. It is possible that the credential from the first program in the series was not sufficient for employment in the manufactured building industry. During the research team's site visit, program staff reported that there were fewer jobs in manufactured construction than initially expected. At the time of grant application, the Miami Dade College consortium identified an increasing demand for homes and buildings that used manufactured construction and a shortage of trained workers. However, that demand for manufactured construction did not materialize for a variety of local reasons. These market conditions appear to have affected the earnings growth of TRAMCON participants.

Finally, participants in the three Chaffey College programs (pre-engineering, industrial maintenance, and industrial automation) had below average positive changes in earnings, ranging from about \$1,011 to \$1,270 per quarter.

### 7.4. PUBLIC ASSISTANCE BENEFIT RECEIPT

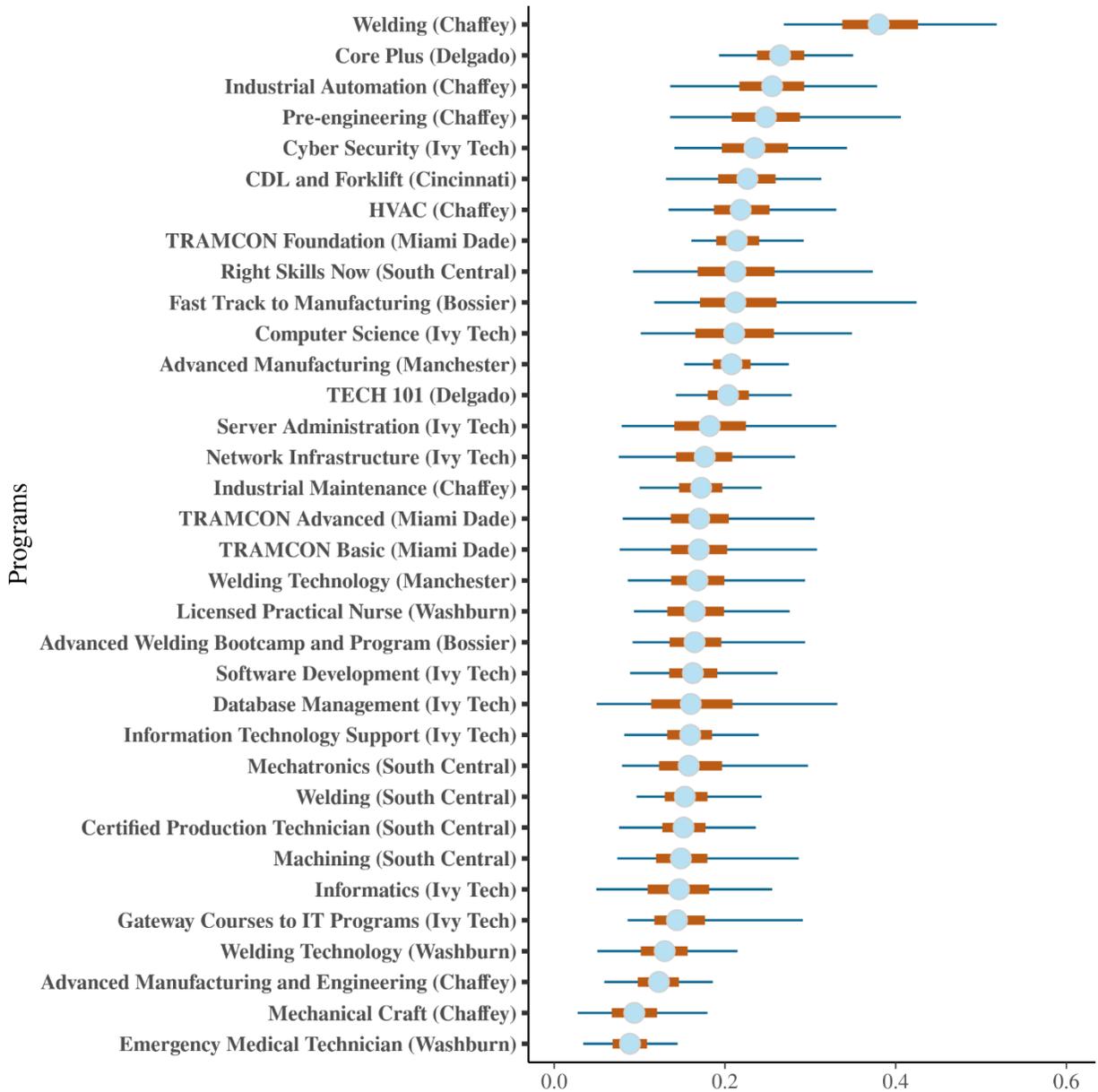
Finally, the research team explored public assistance benefits receipt among program participants at the time of the short-term follow-up survey—including participants still enrolled in their program.

## CHAPTER 7: PARTICIPANT OUTCOMES, BY PROGRAM

A small percentage of participants received public assistance benefits at the time of the follow-up survey.

As shown in **Exhibit 7-4**, the Chaffey College welding program participants were outliers. An estimated 38 percent received public assistance benefits at the time of the survey; the next largest estimate is 26 percent at the Delgado Community College Core Plus program, which, as described above, had a low training-related employment rate. Welding had the lowest completion rate among Chaffey College’s programs (12 percent), although it was its longest program (18 months).

**Exhibit 7-4. Projected Public Assistance Benefits Receipt for Future Cohorts, by Program**



Source: Short-term participant follow-up survey

Note: Sample is 2,211 survey respondents. Circle marks projected completion rate for future cohorts at the program. Thin blue line traces 99.9 percent credible interval. Thick orange line traces 80.0 percent credible interval.

At the other end of the spectrum, two Washburn University programs (emergency medical technician and welding technology) and two Chaffey College programs (mechanical craft and advanced manufacturing and engineering) had the lowest estimated rates of public assistance benefit receipt. Both Washburn University programs had high program completion rates, but mixed training-related employment rates, with emergency medical technician program participants having the lower.

### 7.5. SUMMARY OF RANKINGS ACROSS THE FOUR OUTCOMES

**Exhibit 7-5** summarizes the outcomes by program by categorizing the programs as those that scored in the top, middle, and bottom third of the desired direction for that outcome. Programs ranking in the most favorable third are shaded in purple, the middle third in orange, and the least favorable third in gray. The table illustrates patterns in program rankings across outcomes. For example, the models predict that future cohorts of students at the Welding Technology program at Washburn University will have high program completion rates, high rates of success at finding training-related employment, high levels of two-year earnings growth, and high levels of success in avoiding the use of public assistance benefits.

#### | Few programs ranked high across all four outcomes.

In general, program rankings varied by the outcome in question. Only one program—welding technology (Washburn University consortium)—scored in the top third across all four outcomes. Four programs—mechanical craft (Chaffey College), licensed practical nurse (Washburn University consortium), Advanced Manufacturing and Engineering (Chaffey College), and machining (South Central College) ranked in the top third on three of the four outcomes.

#### | Seven programs that ranked low for program completion and training-related employment were nonetheless in the top third for change in earnings.

All seven of these programs were in the information technology sector and offered at Ivy Tech Community College. The college had some of the longest programs in the outcomes study, lasting between 14 and 24 months. Because earnings are measured about 15 months after program entry, many participants had not yet had an opportunity to complete their program. Information technology jobs have high earnings potential.<sup>64</sup> It is possible that participants who completed their program secured high-paying jobs, those who did not complete their program were nonetheless hired at well-paying jobs, and those still enrolled obtained jobs while continuing their training. This possibility still begs the question of why the college's participants' rate of training-related employment was low as compared to other programs. Perhaps even if its participants did not secure a job in the particular information technology field of their training, they were still able to obtain well-paying jobs in the general sector. For example, someone training for a computer science credential may have been able to obtain a job at a corporate information technology helpdesk.

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<sup>64</sup> <https://www.bls.gov/ooh/computer-and-information-technology/home.htm>

# CHAPTER 7: PARTICIPANT OUTCOMES, BY PROGRAM

**Exhibit 7-5. Summary of Program Rankings, by Outcome**

Program	Program Completion	Training-related Employment	Change in Earnings	Public Assistance Benefits Receipt
Welding Technology (Washburn)	6	2	8	4
Mechanical Craft (Chaffey)	4	4	15	2
Licensed Practical Nurse (Washburn)	3	1	9	15
Advanced Manufacturing and Engineering (Chaffey)	7	8	22	3
Machining (South Central)	24	5	7	7
Emergency Medical Technician (Washburn)	5	20	21	1
Welding (South Central)	17	11	12	9
Welding Technology (Manchester)	9	12	13	16
Advanced Manufacturing (Manchester)	8	3	17	23
Certified Production Technician (South Central)	20	9	19	8
Mechatronics (South Central)	27	17.5	3	10
Advanced Welding Bootcamp and Program (Bossier)	18	10	25	14
Informatics (Ivy Tech)	25	30.5	6	6
Gateway Courses to IT Programs (Ivy Tech)	23	24	20	5
Industrial Maintenance (Chaffey)	11	13	29	19
TRAMCON Basic (Miami Dade)	14	15	28	17
Industrial Automation (Chaffey)	10	7	27	32
Right Skills Now (South Central)	21	16	16	25.5
Network Infrastructure (Ivy Tech)	28	27	5	20
TRAMCON Advanced (Miami Dade)	13	25	24	18
CDL and Forklift (Cincinnati)	1	17.5	33	29
Pre-engineering (Chaffey)	15	6	30	31
Software Development (Ivy Tech)	29	30.5	11	13
Server Administration (Ivy Tech)	34	28	1	21
Fast Track to Manufacturing (Bossier)	19	14	26	25.5
Database Management (Ivy Tech)	32	32	10	12
TECH 101 (Delgado)	12	22	31	22
Information Technology Support (Ivy Tech)	30	33	14	11
Cyber Security (Ivy Tech)	31	29	2	30
HVAC (Chaffey)	22	21	23	28
TRAMCON Foundation (Miami Dade)	16	19	32	27
Computer Science (Ivy Tech)	33	34	4	24
Core Plus (Delgado)	2	26	34	33
Welding (Chaffey)	26	23	18	34

Note: Exhibit is sorted by earnings growth, sum of all four ratings, then training-related employment.

KEY	Most favorable	
	Average	
	Least favorable	

**Four programs that ranked high for program completion and training-related employment were in the middle or bottom third for change in earnings.**

These programs were mechanical craft, advanced manufacturing and engineering, and industrial automation at the Chaffey College consortium; and advanced manufacturing and welding technology at the Manchester Community College consortium. It is notable that all four programs are in the manufacturing and welding sectors. In general, participants in these programs experienced earnings increases, but the programs were rated in the middle (rather than top) third of programs in the change in earnings outcome. Jobs in the advanced manufacturing sector do not demand wages as high as those in sectors such as information technology. Whereas the median annual wage for computer and information technology jobs was \$86,320 in 2018,<sup>65</sup> the median wage for machinists and tool and die makers (an example occupation in the advanced manufacturing sector) was \$44,950.<sup>66</sup> It may be that industry trends in wage rates helped Ivy Tech Community College participants to increase their quarterly earnings more than did participants in the Chaffey College consortium's and Manchester Community College consortium's welding and manufacturing programs. It is important to note, however, that the relatively short follow-up period for this study limits what can be learned about wage increases.

**Nine programs that were in the top or middle third for program completion and training-related employment were in the bottom third for change in earnings.**

These programs were commercial driver's license and forklift (Cincinnati State Technical and Community College); TECH 101 (Delgado Community College); advanced welding bootcamp/program and fast track to manufacturing (Bossier Parish Community College); pre-engineering, industrial maintenance, and industrial automation (Chaffey College consortium); and TRAMCON basic and foundation (Miami Dade College consortium). These 9 were among some of the shorter programs in the outcomes study; the average program duration for these programs was 3.1 months. Therefore, it stands to reason that participants finished these programs at relatively high rates inside the approximately 15-month follow-up period. However, such short-term programs appeared to have not yielded much in earnings gains. Again, a longer follow-up period would provide more insight into participants' longer-term change in earnings.

**Of the 11 programs in the top third for training-related employment, 10 were in the manufacturing and welding industries.**

These were programs in the Chaffey College, Manchester Community College, South Central College, and Washburn University consortiums plus programs at Bossier Parish Community College. Manufacturing and welding programs appear to have performed well in helping their participants to secure training-related employment. This performance could be due to the specialized technical skills that participants gained through practice on equipment at, for example, Chaffey College's InTech Center and the Miami Dade College consortium's Transformative Learning Centers. It could also be due to job placement assistance provided by, for example, job placement specialists in Cincinnati State Technical and Community College's forklift program or the career coach in Bossier Parish Community College's welding programs.

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<sup>65</sup> Ibid.

<sup>66</sup> <https://www.bls.gov/ooh/production/home.htm>

## 8. Summary and Discussion

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This report explored a wide range of participant outcomes as well as characteristics at program entry for participants who enrolled in 34 programs implemented by nine selected TAACCCT Round 4 grantees. The 34 programs were generally short-term, culminated in a credential, were fully or largely supported with grant funds, and had a specific point of intake that facilitated study enrollment. In addition to outcomes for the entire sample of 2,767 participants, the report presents outcomes by participant characteristics and participant service receipt for four outcomes: program completion, training-related employment, change in earnings, and public assistance benefits receipt outcomes. Finally, it describes projected outcomes for future participant cohorts by program for these same four key outcomes.

The TAACCCT capacity-building theory of change made three assumptions: (1) Grant-funded programs would target adult learners who were older; had work experience; and were beneficiaries of the Trade Readjustment Allowances (TRA) program, veterans, or unemployed adults.<sup>67</sup> (2) Grantees would implement a combination of strategies to support accelerated and enhanced learning, persistence and completion, and connections to employment. (3) Grantee strategies would produce positive short-term participant outcomes related to program completion, employment in the occupation for which they trained, change in earnings, and public assistance benefits receipt.

This chapter explores the extent to which outcomes study findings aligned with the theory of change. It then describes possible reasons for unexpected results.

### 8.1. HOW FINDINGS ALIGN WITH SHORT-TERM OUTCOMES IN THE THEORY OF CHANGE

The outcomes study explored the characteristics of participants at program entry and reported their education, employment, earnings, and public assistance benefits receipt outcomes approximately 15 months after program entry. It also explored how outcomes varied by subgroups of participants defined by demographic and economic characteristics, by service receipt during the program, and by grant-funded program. This section considers how these findings align with the TAACCCT theory of change.

**Most participants were adult learners who were older and had work experience, which is consistent with the theory of change.**

Almost 60 percent were 25 or older at the time they entered their program. Most had at least some postsecondary education (53 percent), most commonly some college but no degree (32 percent). On average, participants were unusually well educated as compared to the low-wage worker population more generally. More than half (56 percent) were working at the time they entered their program. Thirty (30) percent had children in their household.

Few participants were TRA recipients or veterans. Less than 2 percent of program participants were TRA benefit recipients at the time they entered their program, and less than 9 percent were veterans. Grantee staff reported during the research team's site visits that they attempted to recruit both groups. The

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<sup>67</sup> TRA benefits are available under TAA.

largest challenge was the small number of TRA recipients and veterans in their catchment areas. TRA receipt has always been relatively small given the criteria needed to qualify for trade dislocation-related job loss. Moreover, TRA receipt was down overall in 2014, when Round 4 grants were awarded. Many grantee colleges and their consortium partners were not in the vicinity of military bases.

**Grantees implemented a range of capacity-building services designed to bolster connections to employment for participants; of them, employment-related supports were most commonly used by participants.**

The nine grantees implemented career pathways programs or stackable credentials. The majority implemented at least one technology-enabled learning strategy, such as online learning. Five grantees implemented prior learning assessments or provided credit for prior learning. Grantees used grant funds to provide a range of academic supports. Five grantees provided one-on-one nonacademic supports through grant-funded staff such as program navigators or recruitment, retention, and completion specialists.

All grantees implemented skills simulations as part of their grant-funded activities; seven offered in-program work-based learning strategies, with internships being the most common. Seven provided job search services either informally (from instructors) or through dedicated grant-funded positions, including career coaches, job placement specialists, and career developers.

The most commonly received services relate to employment. More than 80 percent of participants reported practicing skills in a work-like physical environment, and about half of participants (48 percent) reported practicing skills in virtual settings. More than half (57 percent) reported some type of direct work experience as part of their program. Forty (40) percent of participants received job search or placement assistance.

Fewer participants received persistence and completion services. Less than half (47 percent) received academic advising and 31 percent received financial aid advising. The most commonly received persistence and completion strategies not related to advising were classes in other skills such as acting professionally (29 percent), critical thinking and problem solving (27 percent), communicating well (26 percent), and working in groups (25 percent). The least common persistence and completion strategies received included classes in handling parenting and other family responsibilities (8 percent) and managing money and personal finances (10 percent).

**Most participants completed their training programs. Program completion was higher for older participants and those with prior college experience.**

Fifty-nine (59) percent of participants finished the required classes for their program; another 17 percent were still enrolled in their program at the time of follow-up. The remainder left without finishing their classes. About half (51 percent) of participants finished their classes and earned an associated credential. The research team considered this group to have completed the program. Participants with some postsecondary education completed their program at a higher rate than those without any postsecondary education; similarly, participants age 25 and older had higher program completion rates than those age 24 or younger.

**One-third of the participants who finished their required classes or left without finishing were employed in a job closely related to their training at follow-up.**

About 33 percent of participants no longer in training were employed in a job closely related to their training. Participants age 25 to 34, and those with more recent employment, had more success finding a job closely related to their training than did younger participants with less recent employment experience. Participants previously employed in manufacturing had higher rates of training-related employment than those previously employed in other industries. This suggests that experienced workers with a stronger connection to the labor market—particularly those who previously worked in manufacturing—were more able to benefit from grant-funded training and services to find related employment.

**Quarterly earnings increased by about \$2,300 between the third quarter prior to program entry and the fifth quarter following program entry.**

Many participants experienced substantial earnings growth: earnings per quarter rose from \$4,900 three quarters prior to program entry to \$7,200 five quarters after program entry. This aligns with the theory of change, which predicted that grant-funded training would accompany substantial positive change in earnings; however, earnings gains were actually larger for those who left their classes without finishing (\$2,715) than for those who finished classes (\$2,224), so it is not clear that the program itself was associated with the increase in earnings. In addition, more than one in five participants (22 percent) had zero earnings five quarters after program entry, suggesting that at least a portion of the sample was unable to find employment.

Positive change in earnings varied by participant characteristics. Younger participants—especially those employed at program entry or who had not worked in the past year—experienced the largest earnings gains. Participants enrolled in longer programs had significantly larger earnings gains than those enrolled in shorter programs. TRA and SNAP recipients had smaller earnings increases than non-recipients.

**A small share of participants were receiving public assistance benefits. Most participants who received SNAP or TANF benefits at program entry were still receiving those benefits at follow-up.**

At the time of program entry, 11 percent of participants were receiving SNAP benefits, and just 2 percent were receiving TANF. These rates were unchanged by the short-term participant follow-up survey. Most participants who were receiving SNAP or TANF at program entry were still receiving public assistance benefits at follow-up. Older participants and those with long periods without employment had higher rates of public assistance benefit receipt.

## 8.2. WHAT DO THE FINDINGS SUGGEST FOR FUTURE PROGRAMS?

The outcomes study findings aligned with the theory of change in some ways (program completion, higher post-program earnings) but not in others (training-related employment, receipt of public assistance benefits). Grantees implemented a range of services but participation varied.

The outcomes study found that particular services were associated with positive outcomes. Specifically, the findings suggest the following:

**Program completion might be further improved through more opportunities for work-based learning opportunities, such as skills practice in work-like physical environments.**

These opportunities were already a very common service; as noted above, more than 80 percent of participants received these services. Those who did not receive this service had a lower program completion rate, less success finding training-related employment, and a less positive change in earnings, even after correcting for baseline differences between those who did or did not receive the service.

The programs with the highest completion rates—Cincinnati State Technical and Community College’s commercial driver’s license and forklift programs; Delgado Community College’s Core Plus program; Washburn University consortium’s licensed practical nurse program; and South Central College consortium’s mechanical craft program—have work-based learning as a central component.

**Specific activities might bolster the prevalence of training-related employment.**

The analyses found that work-based learning was associated with training-related employment. The program with the highest rate of training-related employment, the Washburn University consortium’s licensed practical nurse program, used a state-of-the-art simulated learning center where participants could practice their diagnostic and treatment skills in a “real life” setting.

The analyses also suggest that training-related employment might be boosted through a number of other services that were received by a minority of participants. These include transfer credits (only 21 percent of participants received any), more financial aid advising (32 percent received any), and employment-related services (40 percent received job search or placement assistance and 25 percent got interviewing practice).

**Two services were associated with short-term earnings growth.**

Transfer credits and work-based learning seemed to increase short-term earnings for participants who received these services. As noted above, the programs with the most positive change in earnings were those that incorporated skills practice. These include Ivy Tech Community College’s IT programs, the Washburn University consortium’s welding program, the Manchester Community College’s welding program, and the South Central College’s mechatronics program. The modest earnings growth may be due to the short follow-up period.

**The analyses did not find any promising approaches to reducing public assistance benefit receipt.**

About the same proportion of program participants received public assistance benefits at the time of the follow-up survey as did a program entry. It appears that some services increased public assistance receipt levels. Participants who received career counseling, academic advising, and financial aid advising received public assistance benefits at higher rates than those who did not receive such services. As well, participants who received credit for prior learning received public assistance benefits at higher rates at follow-up than those who did not receive such credit.

One possible explanation for this finding is that advising services are often bundled and can include referrals to support services, including public assistance programs. Some of the programs associated with

higher rates of public assistance benefits receipt, such as Core Plus, incorporated advisors who provided a range of services to participants. The Core Plus program navigators attempted to meet with all participants to create Individual Service Strategies that, among other things, identified barriers to participation and needed referrals to additional services.

| **It may be too early to gauge employment, earnings, and public assistance benefits receipt outcomes.**

Because the follow-up period was relatively short (about 15 months between program entry and the follow-up survey), it is possible that many of the programs' effects on employment, earnings, and public assistance benefits receipt are not yet observable. A longer study time horizon could shed light on whether participants still enrolled in their program finish its classes and earn associated credentials. It could also reveal whether those who completed their program return to train for the next step on that career pathway; more participants move into training-related employment, perhaps after an initial job not related to their training; earnings grow more and for most participants; and public assistance benefits receipt declines.

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