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REPORT

FINAL REPORT

Bridging the Gap in Workforce and Education Services: Career Coaching in the Virginia RETHINKS Health Sciences Education TAACCCT Program

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CONTENTS

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TABLES

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FIGURES

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LIST OF ACRONYMS

AJC	American Job Center
ASR	Academic Services and Research
CIP	Classification of Instructional Programs
CSC	career studies certificate
DOL	U.S. Department of Labor
n.a.	not applicable
NA	not available
OLS	ordinary least squares
QUINN	Question Information Navigator
SAILS	Student Assistance and Intervention for Learning Success
TAA	trade-adjustment assistance
TAACCCT	Trade-Adjustment Assistance Community College and Career Training
UI	unemployment insurance
VCCS	Virginia Community College System
WDS	Workforce Development Services
WES	Workforce Enterprise System
WIA	Workforce Investment Act
WIOA	Workforce Investment Opportunity Act

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EXECUTIVE SUMMARY

In 2011, the U.S. Department of Labor (DOL) awarded Tidewater Community College a $24 million Round I Trade-Adjustment Assistance Community College and Career Training (TAACCCT) grant to implement Virginia RETHINKS Health Sciences Education in all 23 community colleges in the Virginia Community College System (VCCS). The VCCS used the grant to implement seven distinct strategies to address gaps in training options, community college capacity, and supportive services to prepare workers for employment. Although originally structured to increase employment in the health field, relatively few students pursued education and training in this area, and the grant effort expanded to serve a broader array of career fields. In May 2014, Tidewater contracted with Mathematica Policy Research to conduct an evaluation of the TAACCCT grant activities. One component of that evaluation was an outcomes study, which is the focus of this report.

The outcomes study focused on career coaches, one of the seven strategies of the RETHINKS program. Career coaches were hired to close gaps in training, capacity, and supportive activities that existed between the workforce development and community college systems so that Virginia workers are better prepared for employment. The outcomes study included three components. First, it examined characteristics, activities undertaken, and outcomes for the 6,652 individuals who participated in the coaching strategy between fall 2012 and spring 2014. Second, it estimated associations between participation in specific types of coaching activities and student outcomes. Finally, it compared participant outcomes with outcomes for nearly 300,000 VCCS students who were not participants. Analysis drew information from administrative data sources, including the strategy's case management data, VCCS registrar data, Workforce Investment Act (WIA) case management data, and Virginia unemployment insurance records.

Coaching strategy and participants

The coaching strategy was structured to coordinate services between the disconnected workforce development and community college systems in Virginia. Prior to the grant, workforce development staff at the American Job Centers (AJCs) referred people seeking information about training programs to community college staff who could provide information about college programs but did not provide coaching or career guidance. Similarly, community college staff could refer students to the AJC, but did not provide information about AJC services that might help students find a job. The 68 coaches hired with grant funding addressed this disconnect by coordinating service delivery, helping community college students and community members explore available training options, building an understanding of occupations in demand in the local area, assisting with job searches, and connecting individuals with local area employers. All 23 community colleges in Virginia implemented the coaching strategy, with coaches based at both colleges and workforce centers. The number of program participants between fall 2012 and spring 2014 varied by college and ranged from 67 to 852 participants.

Most career coaching participants were female, white, or over the age of 24. Participants who were VCCS students before engaging in coaching activities were more likely to be white and older than participants who were not VCCS students. Participants who were VCCS students were generally:

- Seeking a degree in an academic program and engaged with coaches at different stages in their college trajectory.
- Described as having characteristics often associated with academic difficulties; more than half were first-generation college students, about 42 percent needed developmental education coursework, and about 68 percent were enrolled part time.
- More likely to present characteristics associated with employment barriers, such as receiving a Pell grant (low income), not being employed, and living in a zip code with a higher unemployment rate.

Coaching activities

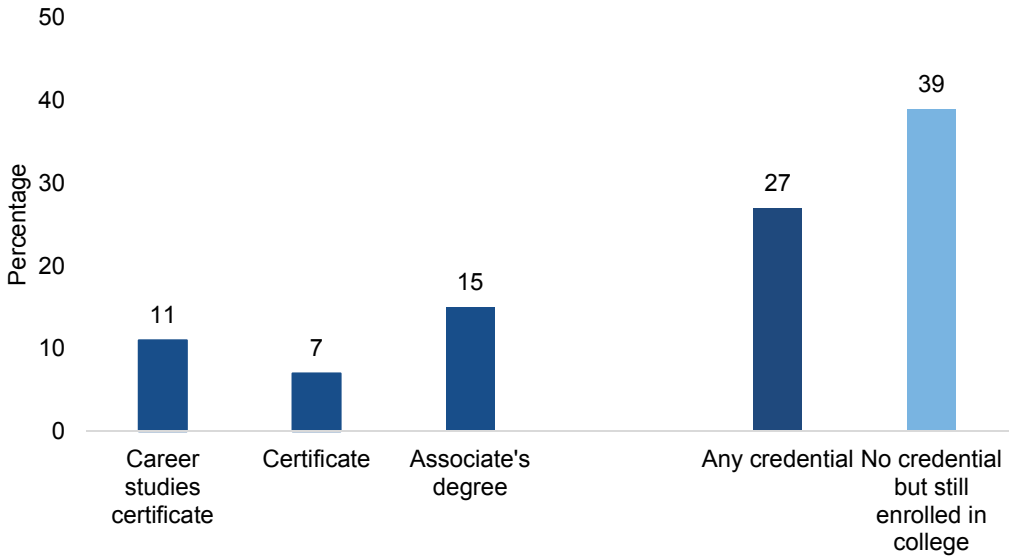
Program participants were required to undertake three activities: (1) an initial assessment; (2) career guidance/planning; and (3) activation of an account in the Wizard—a web-based advising tool developed under another TAACCCT-funded strategy. Program participants could also engage in 21 optional program activities, with about three-quarters engaging in some activities beyond those required. Optional activities were offered in three tiers, each with different rates of take-up.

1. About 67 percent engaged in at least one of five **core activities**. These self-service or limited staff-assisted services included help finding a job, referrals to supportive services, and an orientation to activities.
2. About 37 percent engaged in at least one of eight **intensive activities**. Such services included skill assessments, reading or math testing, and connections to programs leading to a career-readiness certificate, expertise and familiarity with computers, education and workplace readiness, or English language proficiency.
3. About 16 percent engaged in at least one of eight **training activities**. Such activities included connecting participants to training services such as apprenticeships, experiential learning, and on-the-job training.

Outcomes following and associated with the coaching strategy

One of the grant's goals was to expand exposure to and completion of VCCS programs, and the coaching strategy seemed to support this goal. About 42 percent of all participants enrolled in VCCS after participation by taking a credit or noncredit course, including 22 percent of those with no prior history of VCCS enrollment. Those who enrolled earned, on average, passing grades in a total of 21 credits, which is almost sufficient to earn a career studies certificate. In addition, two-thirds of VCCS students who engaged in coaching activities either obtained a VCCS credential or were on track to do so (Figure 1). Of those who obtained a credential, the most common types were an associate's degree, followed by career studies certificate and a certificate. About 40 percent of certificates and career studies certificates were in the health field.

Figure 1. Education outcomes following coaching

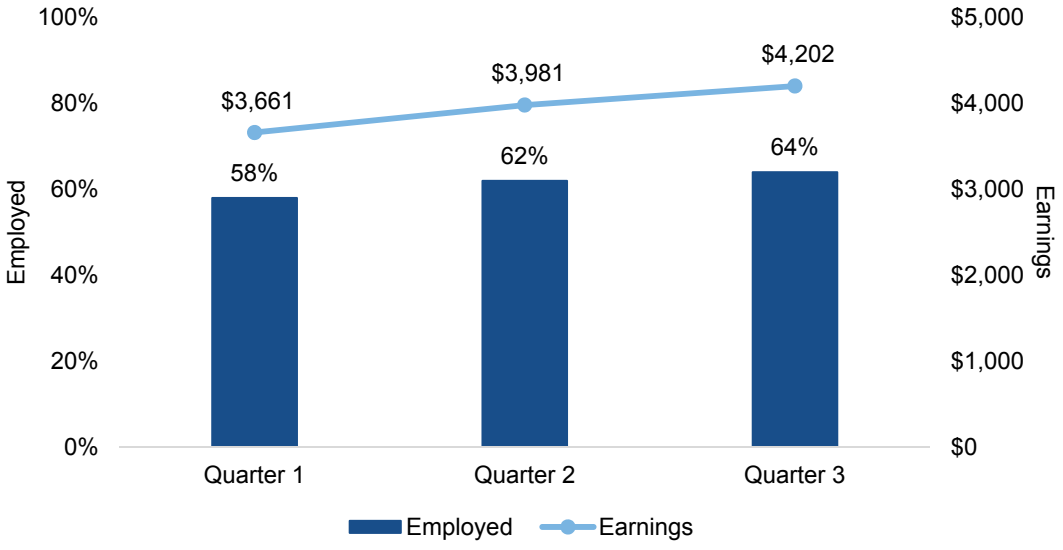


Source: Appendix B, Table B.12.

Note: Figure shows education outcomes for VCCS students who participated in the coaching program. No credential but still enrolled in college shows the percentage of VCCS students without a credential who enrolled in a credit course in spring 2014. The percentage earning "any credential" does not equal the sum of individual credentials, because some participants obtained multiple credentials.

Both the employment rate and earnings (for those employed) increased after participating in coaching activities (Figure 2). Employment rates increased from 57 percent at program entry to 64 percent in the third quarter after becoming a participant. Quarterly earnings increased from an average of $3,661 in the first quarter to $4,202 in the third quarter after participation.

Figure 2. Quarterly employment and earnings after becoming participants



Source: Appendix B, Table B.15.

Note: Figure shows employment outcomes for VCCS students who participated in the coaching program.

Education and labor market outcomes varied with the type of coaching activity: engaging in core activities was associated with a $276 increase in quarterly earnings; engaging in intensive activities was associated with about a 5 percentage point increase in the likelihood of obtaining a certificate; and engaging in training activities was associated with a 5 percentage point increase in the likelihood of obtaining a career studies certificate (but a lower likelihood of obtaining another type of certificate). In addition, each of the three activities was associated with a 3 to 5 percentage point higher employment rate.

VCCS students who participated in coaching activities were more likely than other students to obtain career studies certificates and associate's degrees. About 5 percent of participants obtained a career studies certificate and 13 percent an associate's degree, compared with 3 percent and 10 percent of nonparticipants. These differences were observed even though participants were more likely than nonparticipants to have characteristics typically associated with lower educational attainment. Engaging in coaching activities was also associated with an employment rate about 4 percentage points higher compared with nonparticipants, although no difference in overall earnings existed.

Implications

The TAACCCT program invested about $2 billion in community colleges around the country to expand and improve their ability to deliver education and career training programs that prepare individuals for employment in high-wage, high-skill occupations. Such investments require rigorous evaluations to enable policymakers and community colleges to identify strategies with the potential to deliver successful education and training programs. The Mathematica outcomes study of the Tidewater TAACCCT grant provides preliminary evidence that the career coaches may be able to provide a diverse clientele with a variety of activities that are associated with increased education and employment outcomes. The potential for career coaches to enhance education and labor market outcomes merits further investigation and offers the possibility for institutionalizing their services. It is only by retaining promising programs, such as coaching, and attesting to their effectiveness, that community colleges can realize the full potential of the TAACCCT investments.

I. EVALUATING THE COACHING STRATEGY

In 2011, the U.S. Department of Labor (DOL) awarded Tidewater Community College a $24 million Round I Trade-Adjustment Assistance Community College and Career Training (TAACCCT) grant to implement Virginia RETHINKS Health Sciences Education. Tidewater was the leader of a consortium that included all 23 community colleges in the Virginia Community College System (VCCS). At the time of the grant, the colleges offered courses leading to 57 associate of applied science degrees; 52 certificates; 13 programs leading to an associate of arts, sciences, arts and sciences, or applied arts degree, and 10 diplomas (http://courses.vccs.edu/programs). The grant was designed to develop the colleges' ability to prepare veterans, trade-affected, and other displaced or low-skilled workers (so-called priority groups) for employment in high-wage, high-skill occupations in the health field by using the following seven strategies to address gaps in training options, community college capacity, and supportive services in health career fields (Sullivan et al. 2015):

1. Hire **career coaches** to help priority groups to connect with training opportunities at the community colleges and overcome barriers to reemployment.
2. Develop new course and career planning modules for **Wizard,** an automated tool designed to address gaps in student supportive services.
3. Develop and implement Student Assistance and Intervention for Learning Success (**SAILS**), an automated early warning and intervention system that allows faculty to directly contact students and support services staff about students' academic progress.
4. Redesign **developmental education** curriculum in mathematics and language arts to reduce the need for remediation; ease the transition to college courses; and increase credential attainment, graduation rates, and transfers to four-year colleges and universities.
5. Develop and implement various **E-health** Sciences career studies certificates (**CSCs**) and related programs to prepare students for employment in the state's growing health care industry.[1]
6. Use the Workforce Enterprise System (**WES**) to streamline the registration and management processes for noncredit courses.
7. Expand implementation of the Question Information Navigator (**QUINN**), a new decision-support system for VCCS designed to link administrative data systems.

In May 2014, Tidewater hired Mathematica Policy Research to conduct implementation and outcomes studies for the TAACCCT grant. The implementation study described how each strategy was implemented across colleges and informed potential replication and scaling of strategies (Sullivan et al. 2015). Results of the outcomes study presented in this report focused on the first strategy, hiring career coaches,[2] because coaches (1) were critical to the grant's goal of closing gaps in training, capacity, and supportive activities and preparing workers for

[1] "E-health" describes health care practice supported by electronic processes and communications.

[2] The grant proposal envisioned two types of coaches—adult career coaches and experiential learning/job placement coordinators—however, their roles and responsibilities overlapped considerably in practice (Sullivan et al. 2015). We therefore refer to them both as *coaches* and do not distinguish between them.

employment in health career fields, and (2) directly or indirectly used tools developed through other strategies to help individuals access academic and career planning support.[3] The outcomes study was designed to understand the characteristics of participants in the coaching strategy and the activities in which they engaged; the education and labor market outcomes following coaching activities; and the association between coaching activities and education and labor market outcomes. The study focuses on program participants—defined as those who completed the three required coaching activities of initial assessment, career guidance/planning, and Wizard activation—because data on those who did not complete required activities were not systematically collected.

In this chapter, we describe the coaching strategy (Section A); the research design, including the questions, data, analysis, and limitations (Section B); and the structure of the remainder of the report (Section C).

A. The coaching strategy

Prior to the Virginia RETHINKS grant, the workforce development and community college systems did not coordinate service delivery. Workforce development staff at the American Job Centers (AJCs) referred individuals seeking information about training programs to a community college representative who could provide information about admissions, financial aid, and curricula (for example), but did not necessarily provide career coaching or guidance. VCCS staff could not provide students with information about activities or funding available through the workforce development system.

The grant allowed for a fundamental shift in thinking by integrating these systems (Figure I.1). By working with workforce investment partners at local AJCs and other partners, colleges could reach out to new people, link people with VCCS occupational training programs,[4] and improve labor market employment and earnings. To achieve this integration, the VCCS used grant funds to hire 68 coaches who were deployed across all 23 campuses based on the number of workers in the local area certified for trade-adjusted assistance (TAA). The coaches were able to help a range of individuals—both from the community college and local community—to access and navigate the colleges' information on financial aid and courses and the workforce development system's resume assistance, wraparound services (such as transportation and child care), and training funds (Sullivan et al. 2015).

[3] For example, coaches helped individuals use the Wizard to learn about VCCS career and training programs. Once enrolled, they could access grant-funded enhancements, including WES, SAILS, and redesigned developmental education. Upon program completion, clients worked with a coach to identify employment options.

[4] VCCS students might be linked to occupational or academic programs better suited to their needs, and those who were not VCCS students might be linked to occupational training that was in demand in the local labor market.

Figure I.1. Approach to success in Virginia RETHINKS

Figure I.2 provides a diagram of how the grant structured the coaching strategy. The inputs column lists the resources needed to implement the coaching strategy, and the activities column lists the four types of coaching activities offered. The three **required activities** involved an initial assessment, career guidance/planning, and activation of an account in the Wizard—a web-based advising tool developed under another TAACCCT-funded strategy. The three tiers of **optional activities** included:

1. **Core activities.** These five self-service or limited staff assisted services consisted of job search assistance/career coaching, job finding clubs, job search workshops, orientations, and referrals to supportive services.
2. **Intensive activities.** These eight activities were generally available to those who could not obtain or maintain employment, particularly employment that allows for self-sufficiency, with the help of core activities alone. Such services often required substantial staff time and involvement and included assessments of basic and occupational skills, reading or math testing, career and interests assessments, and connections to workplace learning experiences and programs to prepare for a career readiness certificate, increase computer literacy, and improve education and workplace readiness and English language proficiency.

3. **Training activities.** Individuals who could not gain reasonable employment with the assistance of core and intensive services might be referred to eight training activities. Such activities could involve apprenticeships, experiential learning, and on-the-job training, or programs for entrepreneurship, industry certification, recertification, and state licensure.

Ideally, this strategy would allow individuals to receive optional activities at a lower tier before moving to a higher, more resource-intensive tier. In practice, however, the strategy was not always successful. Consistent with services offered at AJCs throughout the country (D'Amico et al. 2004; Dunham et al. 2005, 2006), people received coaching activities from multiple tiers simultaneously or services from only one tier briefly before moving to the next tier.

Figure I.2. How coaching improves education and employment outcomes

Inputs →	Activities →	Intermediate outcomes →	Outcomes
Number of coaches Wizard AJC policy and practices Virginia Employment Commission policy and practices	**Required** Initial assessment Career guidance and planning Wizard activation **Optional** *Core*. For example, job finding club, job search workshop, referral to support services. *Intensive*. For example, assessment of skills and service needs, computer literacy, English as a second language. *Training*. For example, apprenticeship, on-the-job training, experiential learning.	**Individuals** Increase VCCS enrollment Increase enrollment in E-health courses Increase course pass rates **Employers** Build stronger connections with community college and workforce systems Build participation in events and programs sponsored by the community college system	**Educational** Increase receipt of career studies certificate (CSC) Increase receipt of degrees and certificates Increase receipt of state licensure or industry certification **Employment** Increase employment rates Increase earnings

Context

Population	Local economy	Other factors
Area demographics Number of veterans, trade-affected workers, and other displaced or low-skilled workers	Unemployment rate Industrial composition Connections between workforce system and employers	Institutional support from the college Physical location of counselors Coaches' past work experience

Source: Adapted from Sullivan, Margaret, Brittany English, Alyson Burnett, and Jillian Berk. *Implementing the Virginia RETHINKS Health Sciences Education TAACCCT Grant.* Washington, DC: Mathematica Policy Research, 2015.

Figure I.2 also shows the outcomes expected from the coaching strategy. Coaching activities should increase the **intermediate outcome** of enrolling individuals in VCCS programs as people become aware of training opportunities. Once enrolled, coaching activities could improve students' performance in courses by offering support services. These intermediate outcomes

should ultimately increase education and labor market **outcomes** with students receiving a CSC, degree, certificate, or state licensure or industry certification, obtaining employment, and increasing earnings.

Influences outside of the control of the grant could affect the inputs, activities, intermediate outcomes, and student outcomes, as the context box in Figure I.2 shows. For example, the local population affected the ability of the coaches to recruit TAACCCT priority groups by their presence in the local area and the local economy affected the ability of the coaches to help individuals find jobs. Other factors, including institutional support from the college, the physical location of the coaches (in college or AJC), and the experiences the coaches brought to the job, also affected the success of coaches (Sullivan et al. 2015).

B. Research design

This outcomes study describes the characteristics of coaching participants, the activities in which they engaged, and their intermediate outcomes at VCCS. The study also describes student outcomes for a subset of coaching participants for whom data on education and employment outcomes were available. It uses data from **participants** in the coaching strategy between fall 2012 and spring 2014, from **participating VCCS students**—a subset of coaching participants who took a least one course for credit between fall 2012 and fall 2013, and from a **comparison group** of nearly 300,000 VCCS students who took a course for credit from fall 2012 to fall 2013 but were not participants in the coaching strategy. The sample used to examine student outcomes—participating and nonparticipating VCCS students—is more restricted than the one used to examine activities and intermediate outcomes, because enough time must have passed to observe outcomes, and data on labor market outcomes were available only for VCCS students.

1. Research questions

The outcomes study addressed five sets of research topics. Together, they describe the characteristics of participants, their activities, their intermediate outcomes, and their education and labor market outcomes.

Research topic 1: Describing program participants

Coaches worked with a diverse group of participants, and the available data allowed us to describe the characteristics of (1) all participants in the coaching strategy, (2) those who were VCCS students when they became participants, (3) those who were not VCCS students when they became participants, and (4) VCCS students who were not participants.[5] Research questions used to guide this analysis include:

- What were the characteristics of program participants, and did they differ between those who were VCCS students when they became participants and those who were not?
- What proportion of VCCS students who became participants sought E-health credentials?

[5] The study did not focus on priority groups, because they made up a relative small proportion of coaching participants.

- How did the characteristics of VCCS students differ between participants and nonparticipants?

Research topic 2: Describing program activities

Coaches provided a variety of optional coaching activities, as described above. Research questions used to guide this analysis include:

- What activities were used most frequently?
- Did the activities differ if individuals were VCCS students when they became participants?

Research topic 3: Describing intermediate outcomes

Because coaches were hired, in part, to strengthen connections between the VCCS and the workforce system and to build participation in VCCS events and programs that connect people to VCCS programs, the VCCS expected the grant to increase enrollment in its programs. Research questions used to guide this analysis include:

- What proportion of participants enrolled in VCCS after participation?
- What proportion of participants enrolled in E-health courses?
- How many credits did participants take? What was their course completion rate (that is, what proportion got a grade of at least a C, or a satisfactory or passing grade)?
- Did these intermediate outcomes vary according to whether individuals were VCCS students when they became participants?

Research topic 4: Describing outcomes and associations for VCCS student participants

Because coaches worked with a diverse group of participants who engaged in different program activities, we expect outcomes following participation to vary. We described such outcomes and assess which activities might be associated with them. Research questions used to guide this analysis include:

- What were the education outcomes following participation?
- What were the labor market outcomes following participation?
- What activities are associated with improved outcomes?

Research topic 5: Comparing outcomes between VCCS student participants and other students

By looking only at participants, we cannot determine whether activities caused the observed outcomes. To gain further insight into the association between participation and outcomes, we compared student participant outcomes with student nonparticipant outcomes (comparison group). We used this insight to address the research question of whether the education and labor market outcomes of VCCS students who participated in coaching activities differed from those of students who were not participants.

2. Data

This study drew information from five sources. Leads in the VCCS Workforce Development Services (WDS) and Academic Services and Research (ASR) departments provided four individual-level files from administrative data housed in centralized systems:

1. **Strategy case management data** included participants' demographics, background information, and date activities were undertaken.
2. **Registrar data** included student demographics, background information, credit and noncredit course enrollment history, and VCCS degrees obtained. Data were derived from the PeopleSoft student information system (demographic, credit enrollments, and degrees) and WDS (noncredit enrollments).
3. **Unemployment insurance (UI) record data** included employment and quarterly earnings and were extracted by ASR from UI records. Data were available only for VCCS students and captured employment and earnings only in the state of Virginia.
4. **WIA case management data** indicated WIA and TAA participation and veteran status and were extracted for program participants by WDS.

In addition, we used public-use unemployment data from the Bureau of Labor Statistics' Local Area Unemployment Statistics. These data included 2012 annual unemployment for all counties in Virginia. Data are publicly available at [http://www.bls.gov/lau].

3. Analysis

We used both descriptive and multivariate analysis to answer the research questions. Appendix A, Section B provides a technical discussion of our analytic methods, which we summarize for each research topic:

- **Participant characteristics, activities, and intermediate outcomes (research topics 1 to 3).** We used means and percentages to describe participant characteristics, the program activities in which they engaged, and their intermediate outcomes (enrollment and progress at VCCS). These statistics allowed us to describe all participants, and compare descriptions between participants who were VCCS students when they began the program and those who were not, and between VCCS students who were and were not participants.
- **Outcomes and associations for VCCS student participants (research topic 4).** We used averages or percentages to describe student education (attainment of CSC, certificates, and associate's degree[6]) and labor market outcomes (employment and earnings) one to two years after a VCCS student became a participant. We relied on regression analysis to better isolate associations between specific activities and outcomes, while controlling for participants' and colleges' characteristics.
- **Comparisons of outcomes for VCCS student participants and other students (research topic 5).** We compared student outcomes of participants and nonparticipants in the same

[6] We do not have data on licenses and certifications, two program outcomes identified in Figure I.2.

college using a regression model that controls for student characteristics and their academic and employment history.

4. Limitations

At least four caveats must be considered when interpreting results of this study.

1. **Results cannot be used to draw causal conclusions.**[7] The data available did not capture all factors that might underlie the relationships among participant characteristics, activities, and outcomes. Regression analysis enabled us to adjust for some of the observable factors that might vary with activities or outcomes but did not capture other important factors (for example, motivation).
2. **The results have limited generalizability.** The analysis of outcomes was based on a subsample of program participants for whom we had outcome data. Although the sample represents most participants in coaching activities, the strategy served a diverse group of nonstudents from the wider community, and our analysis did not capture their outcomes.
3. **We could not capture long-term outcomes.** Because the coaching strategy started in 2012, insufficient time had elapsed at the time of data collection for most participants to experience longer term outcomes, such transferring to a four-year college or obtaining a bachelor's degree.
4. **We could not capture labor market outcomes for all individuals.** Employment outcomes were drawn from Virginia's UI records, which excluded information for those working in another state or in jobs not covered by their database. Attributing zero employment and earnings to these workers creates inaccuracies in our reporting of labor market outcomes.

C. Structure of report

We structured the next report chapters around research topics. Chapter II answers the first research topic and discusses patterns in participation and characteristics of those who became participants between fall 2012 and spring 2014. Chapter III answers the second and third research topics on program activities and intermediate outcomes. It shows the diversity in the coaching activities undertaken and enrollment patterns of participants who enrolled in VCCS. Chapter IV answers the fourth and fifth research topics on student education and employment outcomes following program participation. It shows a correlation between engaging in activities and increased credentials for VCCS student participants as compared with students who did not participate in the coaching program. Chapter V provides some implications of the findings of our research.

Two appendices provide readers with more technical material. Appendix A provides details of the data and analysis undertaken, and Appendix B provides the main data tables on which we base figures in the text.

[7] A quasi-experimental design study that would allow such inferences was not possible, because we could not adequately predict who participated in coaching activities. An estimation regressing participation on student characteristics and college fixed effects explained less than 10 percent of the variation in who was a participant (that is, R-squared was less than 0.1), indicating that existing data cannot explain who engages in coaching activities.

II. COACHING PARTICIPANTS

This chapter examines patterns of participation (Section A) and characteristics (Section B) of those who became participants in the coaching strategy from fall 2012 to spring 2014. We pay particular attention to differences between those who were VCCS students by the time they became coaching participants (that is, had enrolled in at least one VCCS course) and those who were not students. Because a large proportion of coaching participants were VCCS students at some point in time, we also compared the characteristics of those who were ever a VCCS student served by the coaches with all other VCCS students (Section C).

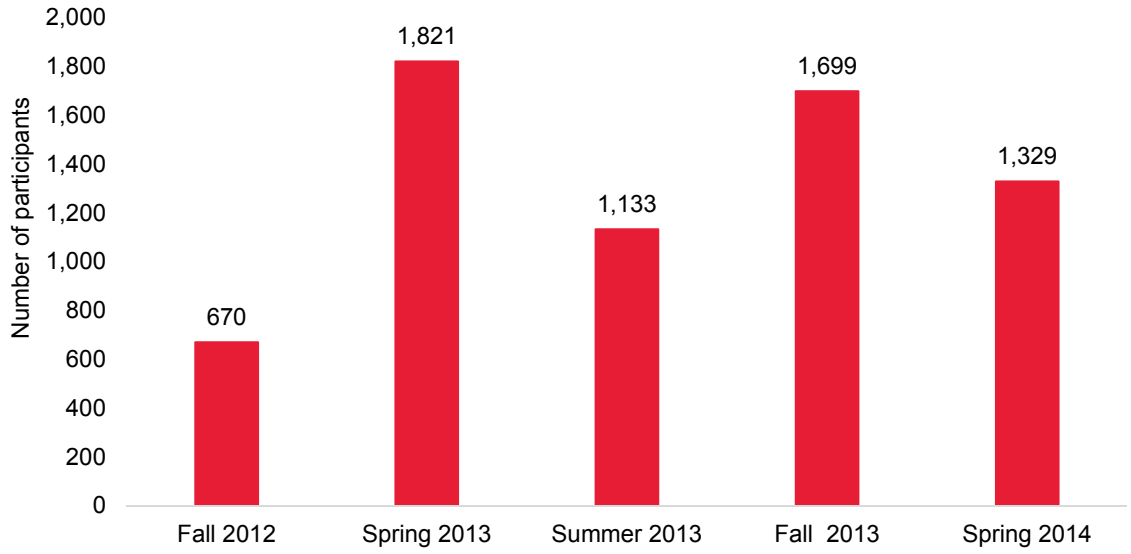
Key chapter findings

- **Between fall 2012 and spring 2014, 6,652 individuals became participants.** Almost 70 percent became participants during the 2013 calendar year and about 76 percent had finished the program by spring 2015. Participation varied dramatically by college.
- **About 32 percent of participants had not taken a VCCS course.** The attraction of clients with no prior relationship with VCCS is consistent with program goals.
- **Among participants, VCCS students were more likely to be younger and white than nonstudents.** Although most participants were white and over the age of 24, those who were already VCCS students when they became participants were more likely to be white and younger than those who were not students.
- **Few participants showed an interest in health programs.** Only about 28 percent of VCCS students planned to pursue a health program, and less than 1 percent of those students chose to pursue an E-health program.
- **VCCS students served by the coaches differed from other VCCS students.** VCCS students who were participants were more likely to have characteristics typically associated with employment barriers than other VCCS students who did not participate.

A. Program enrollment

Between fall 2012 and spring 2014, 6,652 individuals completed the initial three activities required to become a coaching participant: (1) an initial assessment, (2) a written education and career plan, and (3) a Virginia education Wizard account activation (Figure II.1). Participation in the coaching strategy started with 670 participants in fall 2012 and peaked in spring 2013 with 1,821 new participants.

Figure II.1. Program enrollment by term

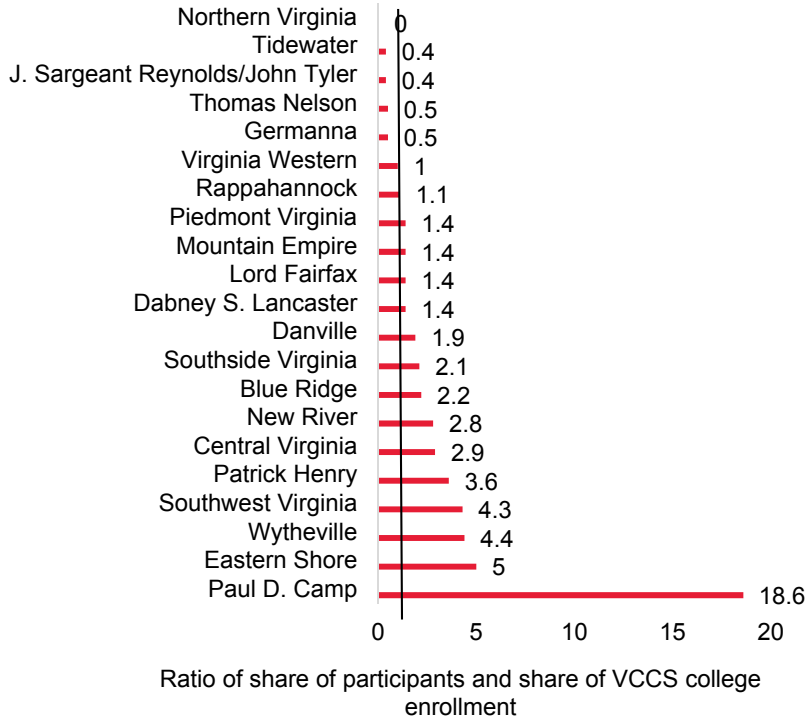


Source: Strategy case management data.

By summer 2015, 76 percent of participants had formally finished the coaching program, which means they had a mutual agreement with the coach that the program objectives were met. Such an agreement typically existed when a participant found a job or enrolled in a training program aligned with career objectives. On average, program participation lasted about four terms, among those that formally exited the program.

Program enrollment varied by college. The largest number of participants were affiliated with Paul D. Camp Community College, with an enrollment of 852 or about 13 percent of participants within the VCCS (Appendix B, Table B.1). Dabney S. Lancaster Community College housed the smallest program, with 67 participants. The size of the program, however, is not necessarily related to the size of the college, as Figure II.2 shows. Paul D. Camp's program, for example, had far more participants proportionately than students enrolled (about 19 times as many) as did Eastern Shore, Wytheville, Southwest Virginia, Patrick Henry, Central Virginia, New River, Blue Ridge, Southside Virginia, and Danville community colleges combined, all of which had only two to five times the proportion of participants than students. In contrast, programs at Northern Virginia, Tidewater, J. Sargent Reynolds/John Tyler, Thomas Nelson, Germanna, and Virginia Highlands community colleges had programs with a lower proportion of participants than enrolled students.

Figure II.2. Participants by college



Source: Appendix B, Table B.1.

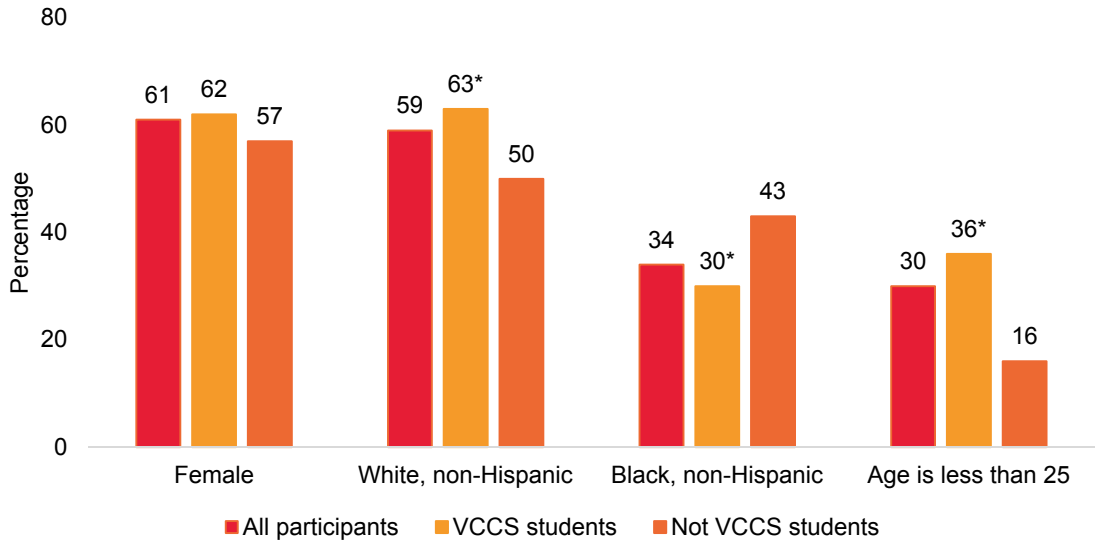
Note: Black line indicates a ratio between participants and enrolled students of 1.

B. Participant characteristics

Although the TAACCCT grants targeted veterans, trade-affected workers, or other displaced or low-skilled workers, coaches faced difficulties identifying and recruiting individuals from these groups (Sullivan et al. 2015). As a result, only about 7 percent had ever participated in the TAA program, and only about 6 percent were veterans (Appendix B, Table B.2). Still, coaches served a variety of participants.

- **Coaches provided services to a significant group of nonstudents, bridging the gap between workforce and education.** About 32 percent of participants were *not* VCCS students when they became participants, meaning they had not taken classes at one of the VCCS colleges by the time they became participants.
- **Most participants were female, white, or over the age of 24.** About 61 percent of participants were female, about 59 percent were white, and about 70 percent were aged 25 or older (average age is 36 year old) (Figure II.3).
- **The characteristics of those who were VCCS students before becoming participants differed from those who were not.** VCCS students by program entry were significantly more likely to be white (63 versus 50 percent), less likely to be black (30 versus 43 percent) and were younger (36 versus 16 percent were less than 25 years of age at program entry) than those who were not VCCS students when they became participants (Figure II.3).

Figure II.3. Participant demographics by VCCS student status



Source: Appendix B, Table B.2.

Note: VCCS student status is determined by whether participants enrolled in a VCCS course prior to becoming participants.

*Difference between participants who were VCCS students and not VCCS students is statistically significant at the 0.05 level, two-tailed test, using a *t*-test for age and a chi-square test for race distribution.

The registrar data provides us with detailed information about VCCS students who became participants (Appendix B, Table B.3, unless otherwise noted). We see that these individuals generally shared the following characteristics:

- **They were first-generation college students from disadvantaged households.** More than half had parents who had only a high school education or less. Only 20 percent had parents with at least a bachelor's degree. About 54 percent had ever received a Pell grant.
- **They sought a degree but generally were not interested in studying health.** More than 70 percent were seeking a degree, meaning that more than half their coursework before participation was in an academic subject rather than in the workforce area. Although the grant was originally structured to increase employment in the health field, particularly E-health programs, few expressed interest in pursuing education and training in this area. Only about 28 percent of participating VCCS students ever mentioned health as an area of study and, of those that did, less than 0.1 percent mentioned pursuing an E-health program (Appendix B, Table B.4).[8]
- **They engaged with coaches at different stages in their college trajectory.** More than 30 percent had accumulated between 9 and 29 credit hours (about the number of credits needed

[8] E-health programs pursued included E-health CSC programs (medical coding, hospital medical coding, and health records coding); an E-health science certificate; and an associate of applied science in nursing (Appendix B, Table B.5). Both the recent college offering of E-health programs and challenges in implementation (Sullivan et al. 2015) are most likely attributed to low interest in the programs.

to obtain a CSC), and about 18 percent had accumulated between 30 to 59 credits (about the number needed to obtain a certificate) when they became participants.

- **They had an academic history that indicated potential difficulties in credential completion.** About 42 percent needed developmental education coursework at some point in their college career, and about 68 percent enrolled part time; both factors known to lengthen the time it takes to complete a program.
- **They had relatively low rates of employment and earnings when becoming participants.** About 42 percent were employed in the quarter prior to becoming a participant, and the average earnings (including those who were not employed) were $3,674 during the quarter.

C. Characteristics of participating and nonparticipating VCCS students

Because a large proportion of coaching participants were VCCS students—the subset of coaching participants who took at least one course for credit between fall 2012 and fall 2013—we can compare their characteristics with the nearly 300,000 other nonparticipating students who enrolled in VCCS during the same time frame. This comparison provides important contextual information to interpret the findings from the outcome analysis discussed in Chapter IV, Section B.

Students who participated in the coaching strategy differed from other students in a number of ways (Appendix B, Table B.6). They were less likely to be Hispanic or Asian and more likely to have characteristics consistent with the purpose of the grant. Specifically, they were more likely to be veterans (7 versus 4 percent) and report seeking a health credential when they first enrolled at VCCS (26 versus 13 percent). They were also more likely to show characteristics typically associated with employment barriers than those who did not participate. In addition, they were more likely to:

- **Start college at an older age, be first-generation college students, and need developmental education.** Participants were older when first enrolled in college (32 versus 28 years of age), were more likely to be the first in their families to go to college (about half versus 33 percent), and had a higher incidence of developmental education (51 versus 42 percent).
- **Receive Pell grants.** The program was more likely to serve students from disadvantaged backgrounds, as evidenced by the federal need-based grants (65 percent of participating VCCS students received Pell grants compared with 36 percent of nonparticipants).
- **Have lower rates of employment and earnings**. Students who were program participants were less likely to be employed in any of the first three quarters in 2012—that is, before participation—than nonparticipants, and when employed, earned about $1,100 less by quarter. Participating students also resided in zip codes with a slightly higher 2012 unemployment rate (3 versus 2 percent).

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III. COACHING ACTIVITIES AT THE AJC AND COLLEGE

Community colleges hired coaches to help individuals navigate both the VCCS and workforce development system. The separation between systems meant that VCCS students often did not take full advantage of workforce development offerings, and those who were not students often did not take advantage of courses and training available at the colleges.

This chapter broadly describes the range of program activities coaches offered under the grant, including activities typically offered through the workforce development center and those offered by VCCS. Consistent with Figure I.2, we use "activities" to describe the optional services offered by coaches beyond those required for participation and "intermediate outcomes" to describe activities occurring at VCCS. Section A describes program activities participants in the coaching strategy undertook, and Section B describes their intermediate outcomes.

Key chapter findings

- **Most participants engaged in few optional activities.** About 23 percent of participants engaged in only the three required activities. On average, participants engaged in only one optional activity.
- **The most popular optional activity was job search/career counseling.** Other popular activities included taking Wizard assessments, developing education and workplace readiness skills, and enrolling in an experiential learning opportunity.
- **About 42 percent of participants enrolled in VCCS after participation.** This group included more than half of those who were already students, along with 22 percent of those who were not previously students.

A. Describing program activities

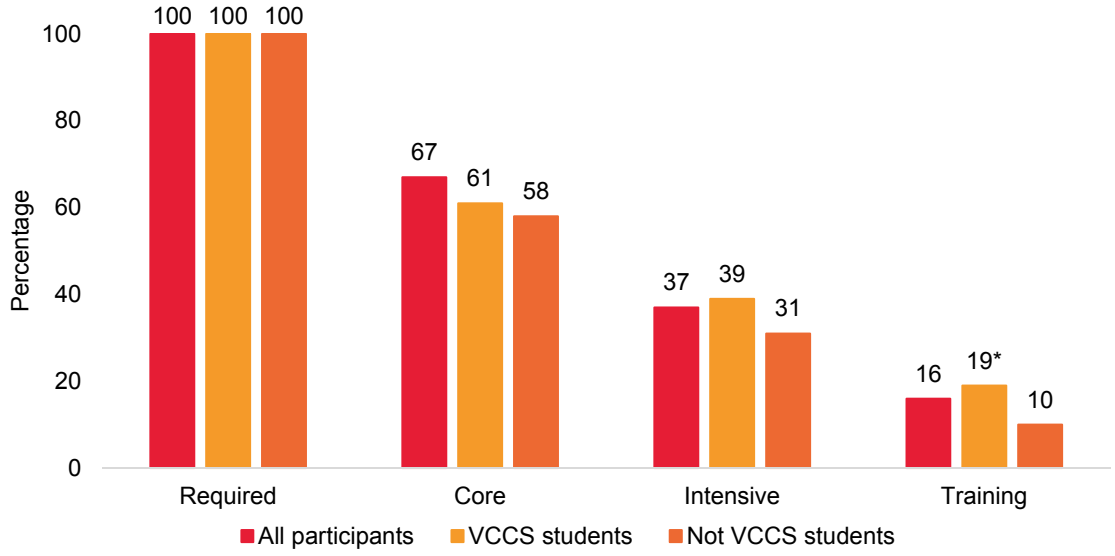
Following completion of the required activities, participants were expected to move into optional activities. The first set were core activities, which were designed to help them engage in job search. Next, some participants were expected to move onto intensive activities, and even fewer participants were expected to engage in training activities. Table III.1 describes the activities in each tier.

Table III.1. Activities offered by coaches

Program activity	Definition
Required	
Career guidance/placement	Establish a written education and career plan that includes an education and an employment goal, appropriate achievement objectives, support service needs (including assistance with admission applications, enrollment processes, and financial aid processes), and an appropriate combination of services based on an initial and a more comprehensive or specialized assessment.
Initial assessment	Help make decisions about appropriate education and employment goals by completing intake form and developing strategies for reaching those goals.
Wizard activation	Create a Wizard account and orient to resources available through it.
Core	
Job finding club	Support group activities and interactions to reinforce job search efforts.
Job search assist/ career coaching	Assist reviewing employment goals and creating plans to achieve those goals.
Job search workshop	Provide interactive presentations to reinforce job search efforts.
Orientation	Provide information on available activities, including coaching, experiential learning opportunities, and job placement.
Referral to supportive services	Refer to services such as child care, transportation assistance, medical referrals, or temporary shelter.
Intensive	
Assessment of skills and service needs	Assess basic skills, occupational skills, prior work experience, employability, interests, aptitudes, supportive service needs, and developmental needs.
CRC preparation	Connect to programs that prepare for career readiness certificate assessment.
Computer literacy	Connect to programs that increase expertise in and familiarity with computers. Programs generally increase the ability to use applications such as Microsoft Office rather than to program the computer.
Education and workplace readiness	Help prepare for unsubsidized employment or training by providing activities that develop learning skills; awareness of skills needed to access education, training, and financial aid; goal setting; decision making, interests, and work values; communication skills; resume development; interviewing skills; punctuality; personal maintenance skills; and professional conduct.
English as a second language	Connect to training to improve English-language proficiency to increase employment opportunities when the native (first) language is not English.
Reading or math testing	Connect to standardized testing that measures ability to read, write, and speak English, and to compute and solve problems at levels necessary to function on the job and in the family and society.
Referral to experiential learning	Refer to a short-term workplace learning experience (such as informational interviewing, job shadowing, or workplace tours) or a long-term one (such as internship or mentorship).
Wizard assessment	Facilitate Wizard assessment to help make an informed choice about a course of action to meet needs and interests and maximize employment opportunities.
Training	
Apprenticeship	Connect to apprenticeship training, where they are employed to learn an occupation and are registered with a sponsor in an approved apprenticeship program. Registered apprentices must take a minimum of 144 hours of apprenticeship-related instruction for each year of their apprenticeship. Apprenticeships are paid and can be credit or noncredit.
Entrepreneurial	Connect to programs to help launch and successfully operate new enterprises.
Experiential learning	Connect to and enroll in experiential learning (see referral to experiential learning).
Industry certification	Connect to and enroll in an instructional program leading to an industry certification.
On-the-job	Connect to paid training while engaged in productive work. The job provides knowledge or skills assessment for job performance and reimburses of up to 50 percent of the wage.
Recertification	Connect to and enroll in an instructional program leading to recertification in an occupational area
State licensure	Connect to and enroll in an instructional program leading to a state licensure in an occupational area.
Training program	Connect to and enroll in a training program not affiliated with a community college.

The take-up rate for each tier of optional activities aligned with the expected progression (Figure III.1). About 60 percent of participants engaged in at least one core activity, 37 percent engaged in at least one intensive activity, and 16 percent engaged in at least one training activity. Those who were VCCS students when they became participants and those who were not generally took up activities at similar rates, with one exception: those who were not VCCS students were more likely to engage in training activities (about 19 percent versus 10 percent). As VCCS students were already familiar with the community colleges, they might be able to continue or pursue training there more easily.

Figure III.1. Participants' take-up of different categories of activity



Source: Appendix B, Table B.7.

Note: VCCS student status is determined by whether participants enrolled in a VCCS course prior to becoming participants.

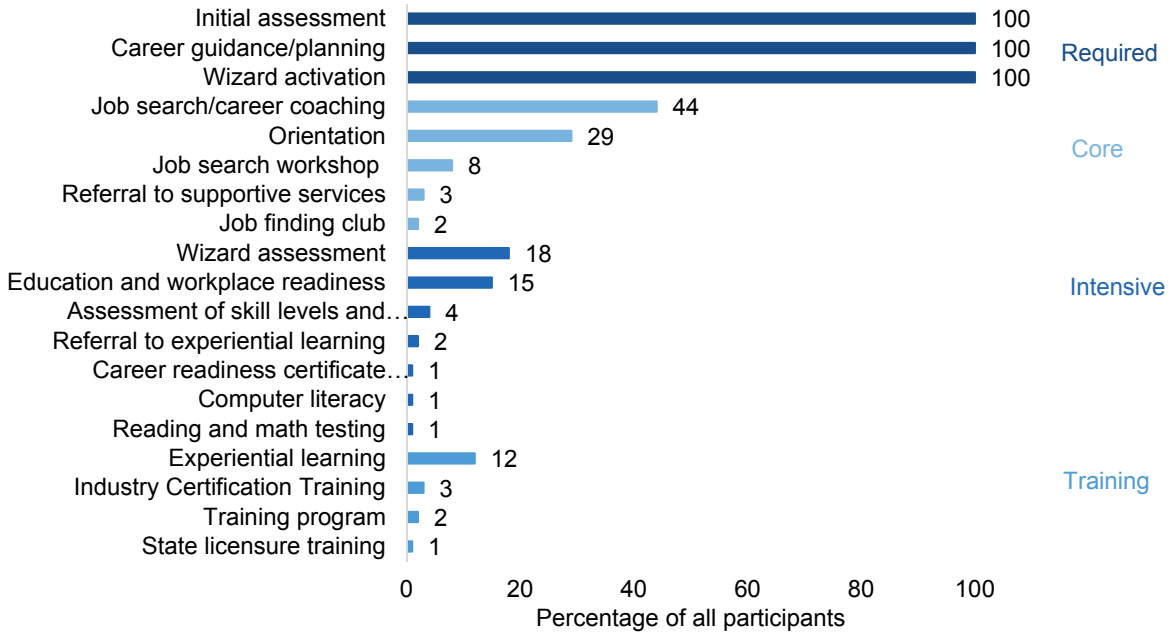
*Difference between participants who were VCCS students and not VCCS students is statistically significant at the 0.05 level, two-tailed test.

The strategy case management data allowed us to more thoroughly study the specific activities participants engaged in within each category (Figure III.2). Our findings show that:

- **About 29 percent of participants began optional activities with an orientation meeting** in which counselors provided information on the activities available.
- **The most frequently used optional activity was counselors' assistance with job search and career coaching** (44 percent), in which counselors reviewed the employment goals of the participants and created an appropriate action plan.
- **The Wizard assessments** (take-up rate of 18 percent) and **education and workplace readiness** (15 percent) were the optional intensive activities most often used. The Wizard offered the possibility to take three assessments—interests, skills, and values—to help participants make informed choices about a course of action that best meets their needs and interests and maximizes their employment opportunities. Education and workforce readiness activities focused on the participants acquiring skills necessary to pursue an educational goal or regain employment such as developing learning, communication, and interviewing skills.

- **Experiential learning was the most used training activity** (12 percent of participants) and included short-term learning experience such as informational interviewing, job shadowing and workplace tours, or a long-term experience such as an internship or mentorship.
- **The take-up rates of optional activities generally did not vary with participants' characteristics** (Appendix B, Table B.8), which suggests that tailoring activities to individual needs leads to little variation in the percentage taking core, intensive, and training activities between (for example) traditional and nontraditional aged students, or target populations and others.

Figure III.2. Participants' take-up of program activities

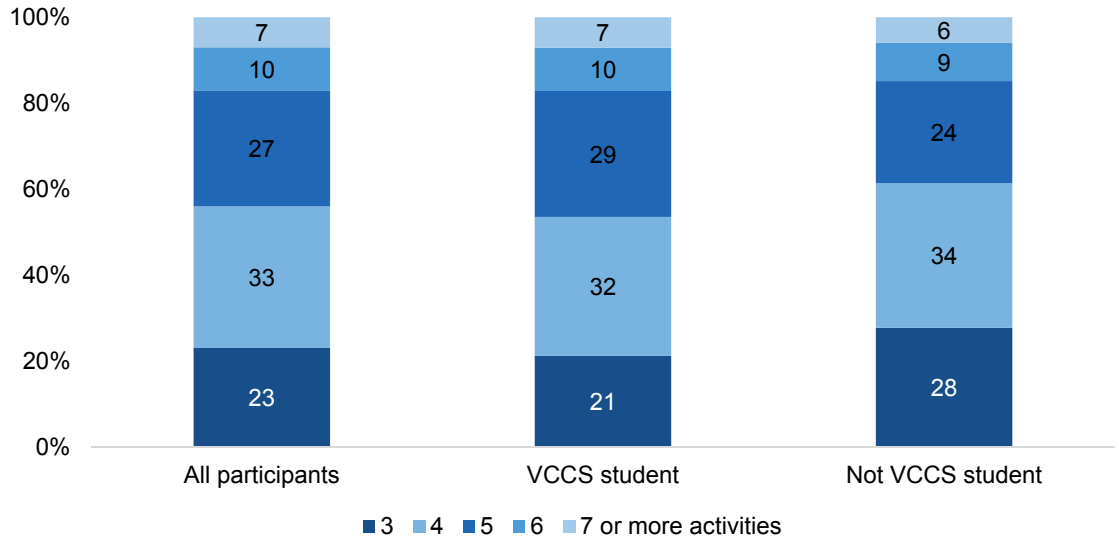


Source: Appendix B, Table B.7.

Note: Figure does not display activities that engages less than one percent of participants.

Most participants engaged in few optional activities (Figure III.3). About 23 percent engaged in only the three required activities, about one-third engaged in four activities (that is, one optional activity and three required activities), and 27 percent engaged in five activities (two optional activities). Only about 17 percent engaged in more than six activities, with the maximum number being 13 activities. Taking-up program activities did not vary by whether participants were VCCS students when they became participants (Figure III.3), but does vary with when the individual became a participant (Appendix B, Table B.10). Those who became participants started shortly after the program started—fall 2012 and spring 2013—and who had more time to take advantage of the program, engaged on average in two optional activities, while those who became participants later engaged in only one.

Figure III.3. Participants' take-up of program activities by number



Source: Appendix B, Table B.9.

Note: All participants took the three required activities. Only those with four or more activities engaged in the optional activities. VCCS student status is determined by whether participants enrolled in a VCCS course prior to becoming a participant.

Some coaching activities were designed to mimic those provided by the workforce development system through WIA programs, which raises the possibility that participants might have received services elsewhere.[9] However, only about one-quarter of participants were also enrolled in WIA programs (Appendix B, Table B.2), which suggests that most participants might not have engaged in coaching activities without the program.

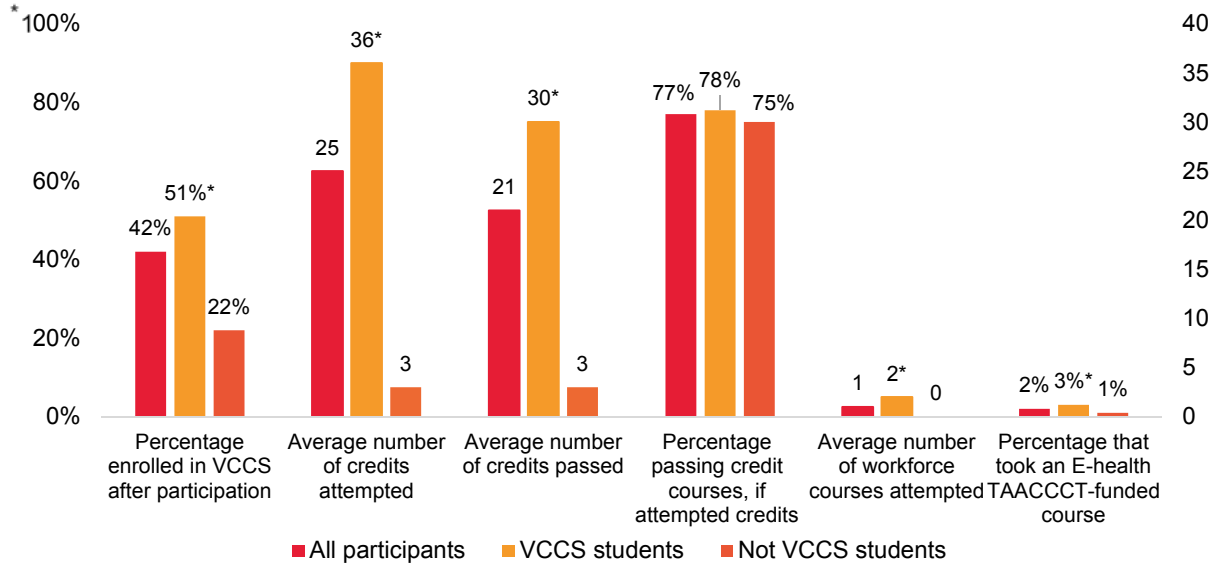
B. Describing intermediate outcomes

The coaching strategy was developed, in part, to strengthen connections between the VCCS and the workforce system and to build participation in VCCS events and programs that connect people to VCCS programs. As a result, VCCS expected to see increased enrollment in its programs, especially in E-health courses—the focus of the grant. Still, not all participants were expected to enroll in VCCS: some dislocated workers or adult participants might only be in need of coaches' services to obtain or regain employment.

About 42 percent of participants enrolled in VCCS after participation (Figure III.4). Those who were VCCS students prior to becoming participants were significantly more likely to enroll in college after participation than those with no prior college enrollment (51 versus 22 percent). The fact that nearly one-quarter of participants with no prior VCCS enrollment enrolled in the VCCS aligns with the grant's goal of improving educational and employment outcomes.

[9] The Workforce Investment and Opportunity Act (WIOA), which supersedes WIA and most of its provisions, went into effect July 1, 2015. Because coaching activities were generally offered under the WIA, we use its structure to discuss provision.

Figure III.4. Intermediate outcomes: education at VCCS



Source: Appendix B, Table B.11.

Note: VCCS student status is determined by whether participants enrolled in a VCCS course prior to becoming participants.

*Difference between participants who were VCCS students and not VCCS students is statistically significant at 0.05, two-tailed.

On average, participants attempted 25 college credits (including those accrued before participation and counting zero credits among those not enrolled) and earned a passing grade in about 21 credits (Figure III.4). Because a CSC is typically awarded to a group of career-related courses totaling between 9 and 29 credits, an average participant might be able to receive a certificate after participating in coaching activities. Not surprisingly, those who were VCCS students at the start of participation accumulated more college credits, on average, than those who were not. Few participants (less than one percent) took workforce courses, consistent with the Chapter II finding that most participants were students seeking a degree.

Although the Virginia RETHINKS grant was originally structured to increase employment in the health field, particularly E-health programs, few students pursued education and training in this area: only about 2 percent of participants enrolled in an E-health course (Figure III.4). Because E-health courses were first offered in fall 2013 (in seven colleges) and 14 out the 23 colleges by spring 2014 when data were collected,[10] few participants had the chance to enroll in these courses.

[10] Tidewater Community College provided documentation on courses connected to the grant as of July 2015.

IV. EDUCATION AND LABOR MARKET OUTCOMES

The coaching strategy was designed to increase education and labor market outcomes by providing activities that directly tied to improved outcomes. This chapter provides preliminary insights into the associations between coaching activities and education and labor market success. It focuses on VCCS students who became participants in fall 2012 through fall 2013 and took at least one for-credit course during that period. Data available (through fall 2014) allowed us to track outcomes for at least one year after individuals become participants.[11] Education outcomes include attainment of a CSC, a certificate, or an associate's degree; and labor market outcomes include employment and earnings following participation. Section A describes participants' outcomes and examines associations between types of program activities (core, intensive, and training) and outcomes, and Section B compares outcomes of participating and nonparticipating VCCS students.

Key chapter findings

- **Most VCCS students who participated in coaching activities persisted in college.** By fall 2014, 27 percent of participants obtained a community college credential, and 39 percent were still enrolled in college.
- **Most VCCS students were employed in the third quarter following participation.** Nearly two-thirds were employed and they earned, on average, about $4,200 a quarter.
- **Outcomes varied with type of coaching activity.** All types of activities were associated with increased employment rates, but core activities were associated with increased earnings; intensive activities were associated with increased likelihood of obtaining a certificate; and training activities were associated with increased likelihood of obtaining a CSC.
- **Participating VCCS students had better education and employment outcomes than nonparticipating students.** Participating students were about 2 percentage points more likely to obtain a CSC and 3 percentage points more likely to obtain an associate's degree. They also had higher employment rates but experienced no difference in earnings.

A. Describing participant outcomes

Because coaches worked with a diverse group of participants (Chapter II) who engaged in different tiers of program activities (Chapter III), we expect, and verify, that both education and labor market outcomes vary following participation.

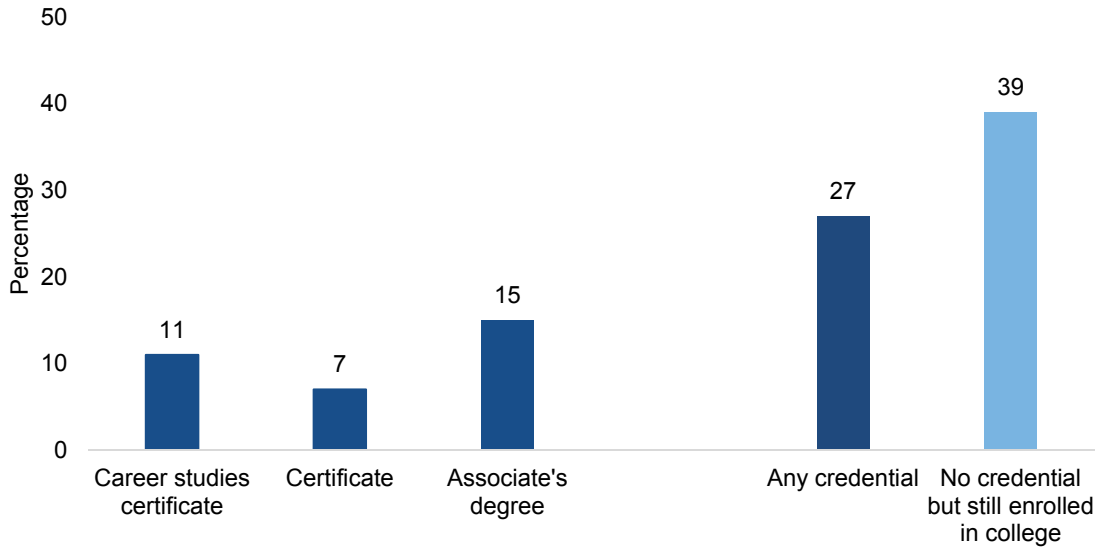
[11] Because outcomes are measured through fall 2014, we track outcomes for different lengths of time after participation. We capture between six terms (two years) of education outcomes for those who became participants in fall 2012 and three terms for those who because participants in fall 2013. We capture between seven quarters of labor market data (for those a participant in fall 2012) and three quarters for those becoming participants in fall 2013.

1. Education outcomes

VCCS students seemed to have positive education outcomes by fall 2014 that are broadly consistent with the goals of the grant.

- **More than one-quarter of participants obtained a credential.** After at least one year and up to two years after becoming a participant, 27 percent had at least one credential (Figure IV.1). About 15 percent earned an associate's degree, 11 percent earned a CSC, and about 7 percent earned a certificate.

Figure IV.1. Education outcomes for VCCS student participants



Source: Appendix B, Table B.12.

Note: No credential but still enrolled in college represents the percentage of participating VCCS students without a credential who were enrolled in a credit course in spring 2014. The percentage of participating students earning "any credential" does not equal the sum of individual credentials, because some participants obtained multiple credentials.

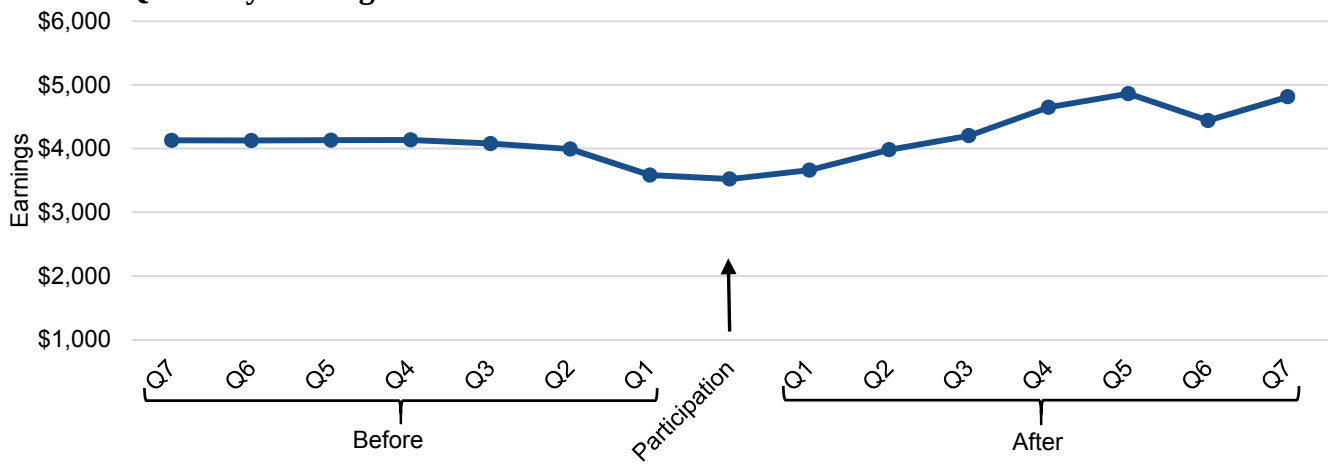
- **Nearly 40 of participants not holding a credential were enrolled** in a for-credit course in spring 2014—the last non-summer term in our data. This enrollment suggests that many participants might still be pursuing a credential.
- **Forty percent of certificates earned were in a health field, but few received E-health certificates.** Perhaps due to the limited time to complete them, only six participating students obtained an E-health credential—four CSCs in medical coding, one CSC in electronic records systems, and one certificate in E-health science (Appendix B, Table B.14).

2. Labor market outcomes

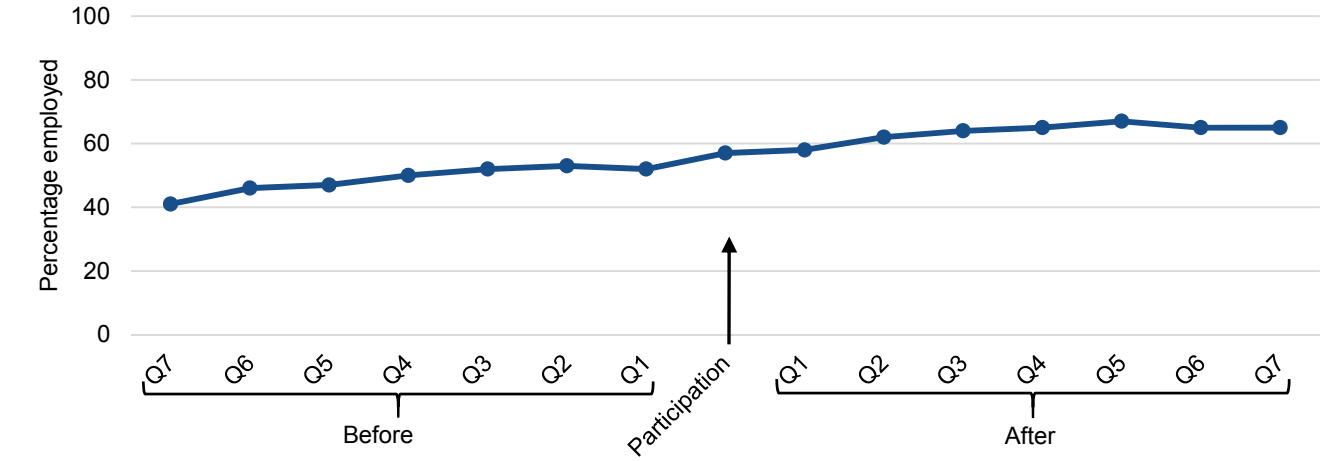
VCCS students who engaged in coaching activities had declining earnings (Figure IV.2, panel A) prior to becoming participants. This phenomenon—commonly known as the Ashenfelter dip (Ashenfelter 1978)—is a recurrent theme in employment programs, because people are often driven to participate in programs when they face an event that negatively affects their employment prospects. This "dip" is observed in earnings but not in employment.

Figure IV.2. Labor market activities before and after becoming a participant, by quarter

Panel A. Quarterly earnings



Panel B. Quarterly employment



Source: UI record data.

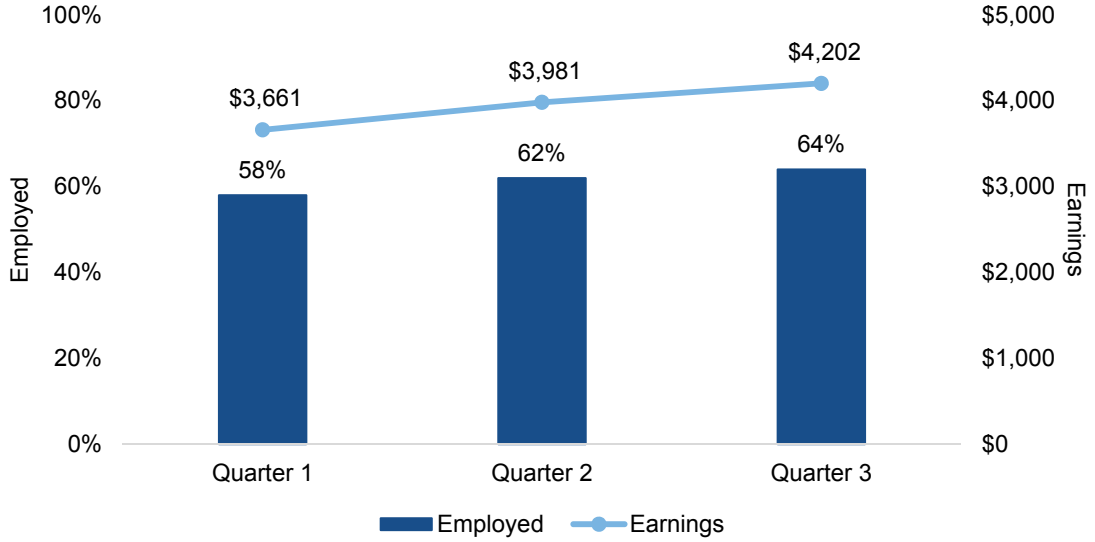
Note: Q1 = quarter 1, Q2 = quarter 2, etc. The participation term indicates when they became participants. All participants are included in the analysis for each quarter before participation and up to the third quarter after participation. Those who became participants earlier had more complete data after participation. For greater details, see Appendix A, especially Table A.4.

These same individuals seem to have positive labor market outcomes by fall 2014, one to two years after participation.

- **Employment rates increased after becoming a participant.** Nearly two-thirds of participants were employed in the three quarters following participation (Figure IV.3). Employment increased from 57 percent at the start of participation to 64 percent by the third quarter after participation. The percentage employed was significantly higher for participants who were not enrolled in college than for those who were not (Appendix B, Table B.15).

- **Quarterly earnings increased after becoming a participant.** Quarterly earnings rose from an average of $3,661 in the first quarter after participation to $4,202 in the third quarter (Figure IV.3). Because UI record data capture earnings without information on hours worked, this increase could reflect a higher hourly wage or more hours worked.

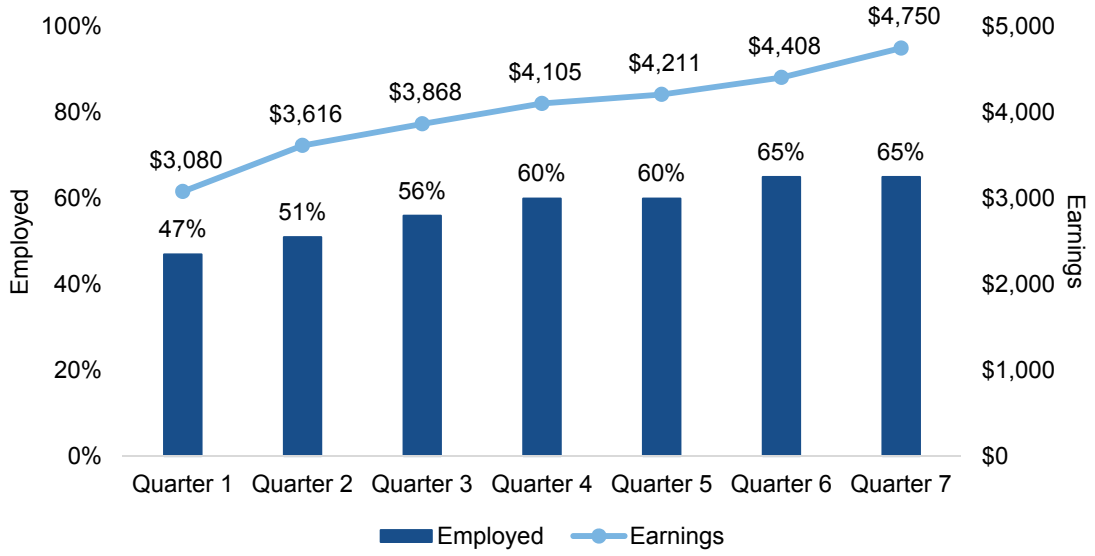
Figure IV.3. Quarterly employment and earnings after becoming participants



Source: Appendix B, Table B.15.

- **Participants reported an average hourly wage of $13 after leaving the coaching program.** Coaches collected self-reported data on participants' hourly wage when a participant formally left the program. This hourly rate was almost twice the minimum wage of $7.25 in the state of Virginia in 2015 and translates into $26,000 per year of full time (2,000 hours) work, which lies slightly higher than the poverty guideline for a family of four in 2015 ($24,250) (ASPE 2015).
- **The positive trend in employment and earnings continued beyond the third quarter after participation.** Because we had almost two years of information on outcomes from those who became participants in fall 2012, we could trace their labor market outcomes for a seven quarters after participation (Figure IV.4). In the seventh quarter after participation, 65 percent were employed and earned, on average, $4,750.

Figure IV.4. Labor market outcomes for those becoming participants in fall 2012



Source: UI record data.

3. Associations between program activities and outcomes

We used a regression framework to control for participants characteristics and college fixed effects to assess whether each type of optional activity (core, intensive, and training) was associated with improved education and labor market outcomes in the third quarter of 2014 (Appendix B, Table B.16). Results suggest that each type of activity was associated with improved outcomes. Specifically, engaging in the following activities resulted in the following outcomes:

- **Core activities** were associated with a 3 percentage point increase in the likelihood of obtaining a CSC, a 4 percentage point increase in employment rate, and a $276 increase in quarterly earnings.
- **Intensive activities** were associated with a 5 percentage point increase in the likelihood of obtaining a certificate and a 3 percentage point increase in employment rate.
- **Training activities** were associated with a 5 percentage point increase in the likelihood of obtaining a CSC but a lower likelihood of obtaining a certificate, potentially because the training helped people focus on a particular career. Training activities were also associated with 5 percentage point increase in employment rate.

B. Comparing outcomes of participating and nonparticipating VCCS students

Although the improvement in participants' education and labor market outcomes shown in descriptive statistics and associations are encouraging, they do not necessarily demonstrate effectiveness of the coaching strategy. Outcomes might improve for VCCS students as a whole, and not just for those engaged in coaching activities. Indeed, because individuals experienced a downturn in earnings before they became participants, labor market outcomes might revert to the status quo even without coaches or across-the-board improvements in the economy (for

example). In this section, we offer some evidence to alleviate these concerns by comparing participants' outcomes with those of other students in the same college who did not participate, while controlling for characteristics and prior employment history.

As we discuss in Section C of Chapter II, VCCS students who participated were different than nonparticipants, and our regression analysis accounts for these observed differences. Still, despite the additional rigor afforced by such analysis, we caution against saying coaching caused the positive outcomes, because students engaging in coaching activities might differ from those who did not in ways that cannot be controlled for in a regression. For example, they might be more highly motivated, and would be successful without the coaching activities. Conversely, participants—particularly those unable to find a job—might seek coaching to help with a host of issues that can negatively affect their outcomes (such as mental health problems or lack of housing) which cannot be captured with available data.

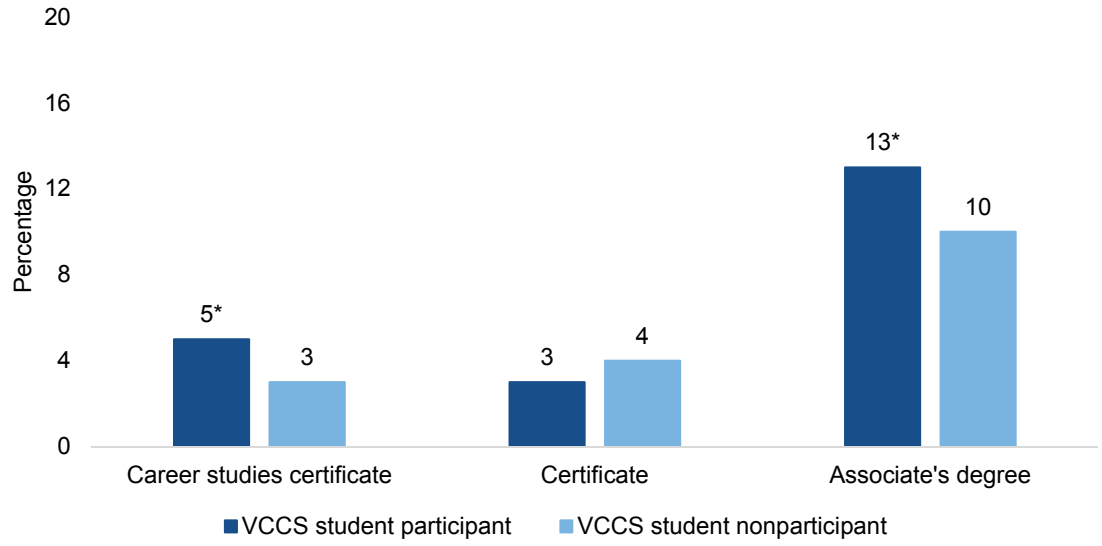
Despite these caveats, comparing participating students with nonparticipating students offers additional evidence of the association between coaching activities and education and labor market outcomes. Figure IV.5 shows regression-adjusted comparisons of education (Panel A) and labor market (Panel B) outcomes between these groups. We see that participation was associated with:

- **An increased likelihood of obtaining a credential.** Participants had a higher likelihood of obtaining a CSC and associate's degree. About 5 percent of participants obtained a CSC degree and 13 percent an associate's degree, compared with 3 percent and 10 percent of nonparticipants. Both groups of students were equally likely to obtain a certificate.
- **An improved employment rate.** Participants were 4 percentage points more likely to be employed in the third quarter of 2014 than nonparticipants in the same college, although they had similar earnings (including those for not employed). Taken together, these results suggest that among those employed, total earnings are lower for participants than nonparticipants. This finding could be driven by a lower hourly wage or by lower number of hours worked, perhaps because participants are more likely to continue their education after obtaining a VCCS credential and have not yet fully committed to the labor market.

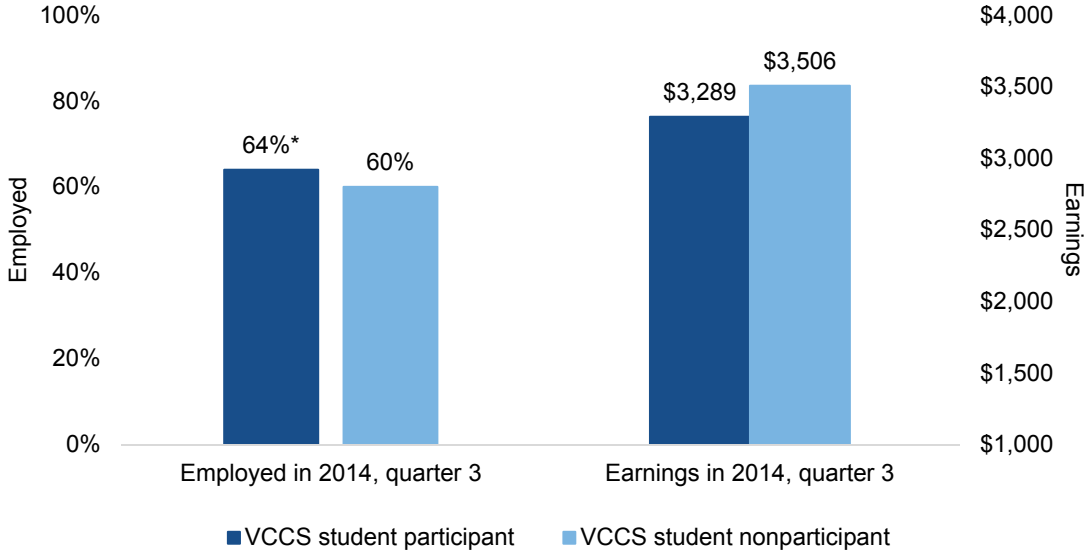
Two limitations to these analysis must be considered when interpreting these results. First, because available data allow us to capture only short-term outcomes (three to seven quarters after participation) when students might still be investing in education, a longer period of time might be needed to fully assess how the increased human capital might improve employment outcomes. Second, because participants have worse earnings before participation (in 2012) than those who did not participate, our regression analysis might not account for unobservable characteristics that gave this group a lower earning capacity, which would diminish our estimated associations between outcomes and engaging in coaching activities and might show no association when a positive association really exists.

Figure IV.5. Participant and nonparticipant outcomes for VCCS students (regression adjusted)

Panel A. Educational outcomes



Panel B. Employment outcomes



Source: Appendix B, Table B.17.

Note: Analysis is based on 3,329 participants and 296,595 nonparticipants. Regressions control for the full set of variables shown in Appendix B, Table B.6.

*Difference between groups is statistically significant at 0.05, two-tailed test.

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V. IMPLICATIONS

The TAACCCT grants invested about $2 billion in community colleges around the country over four years to expand and improve their ability to deliver education and career training programs that prepare program participants for employment in high-wage, high-skill occupations. Such investments require evaluations to enable policymakers and community colleges to identify strategies with potential to deliver successful education and training programs. This study evaluated one TAACCCT-funded strategy—offering career coaching activities—as it was implemented under the Virginia RETHINKS Health Sciences Education program. The program was designed to address gaps in training options, community college capacity, and supportive services to prepare workers for employment. It provides preliminary evidence of success in that strategy.

Under the coaching strategy, colleges hired coaches to help a range of individuals—both from the community college and local community—to access and navigate the VCCS and the workforce development system. By better integrating the systems, individuals should have better access to college programs; coursework and services, such as information on financial aid; and workforce development services, such as resume assistance, wraparound services (such as transportation and child care), and training funds.

Because the cost of providing coaching activities is primarily the coaches' compensation, this strategy may be difficult to sustain after grant funding ends. Other strategies implemented as part of the Virginia RETHINKS grant may have had relatively high start-up costs from developing information systems (Wizard, SAILS, WES, and QUINN) or curricula (developmental education reform and E-health) but lower maintenance costs to sustain after the grant. Given the expenses, one factor in continuing the coaching strategy should be an established link between its activities and improved education and labor market outcomes.

Evidence from this study suggests that the coaches provided a diverse clientele with a variety of activities and connections to VCCS programs and might increase education and employment outcomes. One of the goals of the grant was to expand exposure to and completion of VCCS programs, and for many students, the coaching strategy may have achieved this goal—about 22 percent of participants who had no prior history of college enrollment became VCCS students after participation; VCCS students who engaged with coaches were 2 percentage points more likely to complete a CSC and 4 percentage points more likely to complete an associate's degree relative to other students. Participation was also associated with a 4 percentage point increase in employment rate. Although earnings remained unchanged after participation, available data do not allow us to assess whether participants were more likely to be employed in low-wage jobs or to work fewer hours, nor do they allow us to assess whether participants are still in school and cannot fully commit to the labor market.

Although the study cannot conclude whether coaching caused participants' improved outcomes, it raises the possibility that coaches might enhance education outcomes and employment rate in the short-term. As a result, VCCS might consider retaining their services and integrating them into the VCCS institutional structure while conducting a more rigorous assessment of their effectiveness. It is only by assessing and then sustaining potentially successful programs that community colleges can realize the full potential of the TAACCCT investments.

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APPENDIX A:

DATA, SAMPLES, AND ANALYSIS

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This appendix describes the administrative data and its use in the analysis that formed the basis of the research presented in this report. The data allowed us to examine characteristics, activities undertaken, and intermediate outcomes for 6,652 individuals that became participants in the coaching strategy from fall 2012 to spring 2014 and to examine education and labor market outcomes for a subset of 3,329 participants who were Virginia Community College System (VCCS) students and 296,595 VCCS students who did not become participants. The appendix has two sections. Section A describes the data and samples used in the analysis and reports the incidence of missing data. Section B describes the methodological approach used to answer each of the five sets of research topics.

A. Data and samples

The research drew information from five sources: four individual-level files from administrative data in centralized systems and one public data file compiled by the Bureau of Labor Statistics.

1. **Strategy case management data.** The Academic Services and Research (ASR) department provided a data file that included participants' demographics, background information, and date activities were undertaken.
2. **Registrar data.** Data included student demographics, background information, credit and noncredit course enrollment history, and degrees obtained from any of the VCCS colleges. Registrar data included data from the PeopleSoft student information system (demographic, credit enrollments, and degrees) and VCCS Workforce Development Services (WDS) (noncredit enrollments).
3. **Unemployment insurance (UI) record data.** Data consisted of employment and quarterly earnings and were extracted by ASR from UI records. Data were available only for students taking (credit or noncredit) courses at a VCCS college and captured employment and earnings in only the state of Virginia.
4. **Workforce Investment Act (WIA) case management data.** Data indicate activities undertaken as part of WIA and are extracted by WDS for program participants.
5. **Local Area Unemployment Statistics.** The public data file from the Bureau of Labor Statistics [http://www.bls.gov/lau] included 2012 annual unemployment for all counties in Virginia.

Table A.1 lists the data elements from each of these five data sources; how they align as a characteristic, activity, or intermediate or final education or labor market outcome; and the sample and timeline for which information is available.

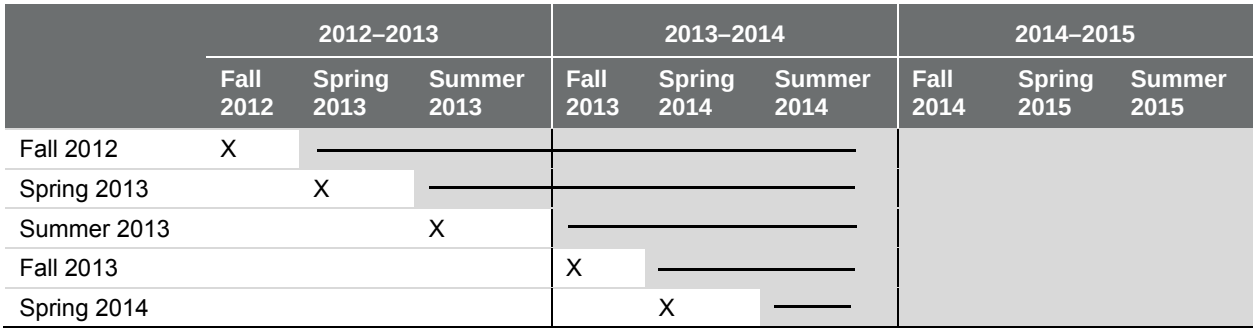
Table A.1. Data elements by source

Classification	Data element	Time frame
All participants from fall 2012 to spring 2014		
Strategy case management data		
Identifier	• Unique study identifier	Since program started in 2012 through July 2015
Characteristics	• Gender • Date of birth • Race/ethnicity	
Activities	• Activities undertaken; start and end dates • Primary college	
Outcomes	• Exit status • Exit date • Self-reported hourly wage at exit	
Workforce Investment Act (WIA) case management data		
Identifier	• Unique study identifier	January 2005 to July 2015
Activities	• Ever received WIA services indicator • Ever received trade-adjustment assistance (TAA) indicator • Ever a veteran indicator	
VCCS students (participants and nonparticipants) enrolled in a course from fall 2012 to fall 2013		
Registrar data		
Identifier	• Unique study identifier	Summer 2008 to summer 2014
Characteristics	• Gender • Date of birth • Race/ethnicity • Ever a veteran indicator • Parental education • Pell grant eligibility status • Zip code of residence each term	
Intermediate outcomes	• Course identifier (include section number) • Course name • Course start and exit date • Course grade • College • Academic plan and Classification of Instructional Programs (CIP) code • Full-time/part-time enrollment status	
Outcomes	• Degree received (certificates, career studies certificate [CSC], associate's degrees) • Date degree awarded • Degree CIP code	Fall 2012 to fall 2014
Unemployment insurance (UI) record data		
Identifier	• Unique study identifier	Quarter 1 2008 to Quarter 3 2014
Earnings	• Quarterly earnings	
Local area unemployment data		
Zip code	• Zip code	2012
Unemployment rate	• Annual unemployment rate in county of residence at first enrollment	

Participant data

Because data files were available through summer of 2015, we had different periods of data for individuals who became participants during different terms, as Figure A.1 shows. The X in this figure shows the term in which the last activity required to become a participant was completed: participants who completed the last required activity between January and April are considered to have become participants in spring, May to July in the summer, and August to December in fall. The shaded area following the term of becoming a participant shows the terms for which we have data. We had data for those who became program participants from fall 2012 to spring 2014. These data comprise a total of 6,652 participants, 4,506 of whom were VCCS students when becoming participants, and 2,146 of whom were not. The information available on activities ranges from four to eight terms of data, as indicated by the shaded cells in Figure A.1. The information available on intermediate outcomes (that is, college enrollment and course-enrollment experiences at VCCS) ranges from one to five terms of data, as indicated by the lines.

Figure A.1. Data and samples for activities and intermediate outcomes



Note: X denotes when a client became a participant. Shaded cells indicate terms after becoming a participant for which we have data on activities from the strategy case management files. The lines indicate the terms after becoming participants for which we have registrar data on intermediate outcomes.

Student data

The sample used to examine education and labor market outcomes is more restricted than the one used to examine activities and intermediate outcomes, for two reasons. First, we must restrict the sample to those who became participants in fall 2012 to fall 2013 to allow sufficient time after participation to track outcomes at least one full academic year for education outcomes and three quarters of a year for labor market outcomes. Second, we must restrict the sample to the subset of 3,329 participating VCCS students, because UI records (the source of labor market outcomes) are available only for that group.

We defined educational outcomes—VCCS credential attainment—as occurring during fall 2012 to fall 2014. The shaded cells in Figure A.2 show the three to six terms since becoming a participant for which we are able to observe VCCS credential attainment. Outcomes for nonparticipants can occur any time from fall 2012 to fall 2014, the equivalent of becoming a participant in fall 2012.

Figure A.2. Data and samples for education outcomes

	2012–2013			2013–2014			2014–2015		
Education term	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014	Summer 2014	Fall 2014	Spring 2015	Summer 2015
Fall 2012	X								
Spring 2013		X							
Summer 2013			X						
Fall 2013				X					

Note: X denotes when an individual became a participant. Shaded cells indicate terms after becoming a participant for which we have data on education outcomes. We define fall as August to December, spring as January to April, and summer as May to July.

We defined labor market outcomes—employment and earnings—as occurring between the first quarter of 2013 and the third quarter of 2014, the period for which UI data are available. As the shading in Figure A.3 indicates, we have labor market data for at least three quarters for all participants and for as many as seven quarters for those who became participants in fall 2012.

Figure A.3. Data and samples for labor market outcomes

	2012				2013				2014			
Wage quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Fall 2012				X								
Spring 2013					X							
Summer 2013							X					
Fall 2013								X				

Note: X denotes term when an individual became participant. Shaded cells indicate the quarters (Q) for which we have data on labor market outcomes. Quarter 1 employment data cover January to March; Quarter 2, April to June; Quarter 3, July to September; and Quarter 4, October to December.

Missing data

Rates of missing data are extremely low, with the exception of parental education (about 40 percent missing) and full-time status at first college enrollment (about 18 percent) (Table A.2). Of note, we have no missing data on outcomes, either intermediate or final, because VCCS has no missing registrar data on courses or credentials, and we presume that individuals without information on earnings in UI records have no information, because they were not employed.

When interpreting rates of missing data, the following must be considered:

- Because we interpret a value for a blank cell, we are never missing information to construct the following variables: WIA participant, TAA participant, Pell grant recipient, dual enrollment and remedial student, full-time student, credits accumulated, and employment and earnings prior to participation. For example, we presume that individuals not flagged as WIA or TAA participants did not receive those services, or that participants with no credits earned in registrar data have accumulated zero credits.

- Some variables were defined based on VCCS registrar data and are therefore not available for participants who never enrolled in VCCS (such as parental education) or not applicable (such as academic history and Pell grant recipient).
- We had two sources of data for characteristics. For veteran, female, age (derived from date of birth), race, and ethnicity, we relied on registrar data for participants and VCCS students who were not considered participants. We relied on the strategy case management data (or WIA case management for veterans) for participants who never enrolled in VCCS. The incidence of missing data in these variables is less than 5 percent.

Table A.2. Missing data on participants' characteristics

	VCCS student when becoming a participant	Ever a VCCS student	Never a VCCS student
Demographic			
Female	3 (0%)	3 (0%)	3 (0%)
Age	7 (0%)	8 (0%)	3 (0%)
Race/ethnicity	113 (3%)	120 (2%)	73 (4%)
Parental education	60 (39%)	1,940 (39%)	NA
Populations of interest			
Veteran	0 (0%)	0 (0%)	1 (0%)
WIA participant	0 (0%)	0 (0%)	0 (0%)
TAA participant	0 (0%)	0 (0%)	0 (0%)
Pell grant recipient	0 (0%)	0 (0%)	n.a.
Academic history			
Dual enrollment student (ever)	0 (0%)	0 (0%)	n.a.
Full-time student on first enrollment	785 (17%)	877 (18%)	n.a.
Remedial student (ever)	0 (0%)	0 (0%)	n.a.
Total credits accumulated	0 (0%)	0 (0%)	n.a.
Academic plan at first enrollment	0 (0%)	242 (10%)	n.a.
Employment history			
Employment and earnings			
One quarter prior to participation	0 (0%)	0 (0%)	NA
Two quarters prior to participation	0 (0%)	0 (0%)	NA
Exit date (for those that formally exited the program)	215 (5%)	226 (5%)	67 (4%)

Source: Strategy case management, WIA case management, registrar and UI record data.

Note: Academic plan at first enrollment is counted as nonmissing for workforce students.

B. Analytical approach

The study is anchored on five key sets of research topics that provide a thorough description of the characteristics of participants, their coaching activities, their intermediate outcomes at VCCS, and their education and labor market outcomes. In this section, we describe our analytical approach to answer research questions in each topic. All analyses used equal weights for each individual, so findings represent descriptions or associations of the average participant regardless of the coach's primary college.

Research topic 1: Describing program participants

We relied on strategy case management and registrar data to describe program participants. Our basic analytic approach presents averages (for characteristics, such as age, with continuous or indicator measures) and percentage distributions (for characteristics, such as race/ethnicity, that are measured in categories). Table A.3 shows the measures of characteristics and employment history we used to describe all participants and the measures of academic history we used to describe participants who were VCCS students when becoming participants.

We conducted two-tailed *t*-tests (for averages) and a chi-squared tests (for percentage distributions) to assess whether differences in characteristics between groups are statistically significant ($p \leq 0.05$). All tests were conducted with adjustments for standard errors clustered at the college level.

Table A.3. Characteristics and academic history

Characteristics	Academic and employment history
• Gender indicator • Age • Race/ethnicity indicators (white, Black, Hispanic, Asian, multirace) • Parental education indicators (high school or less, some college, college graduate)* • Ever participated in TAA program indicator • Ever participated in WIA program indicator • Pell grant recipient indicator* • Veteran indicator • Unemployment rate in zip code of enrollment* • Still participating indicator (that is, case not closed)	Academic history (for VCCS students) • Academic plan at first enrollment indicators (five top codes) • Credits accumulated[a] • Ever was a dual enrollment student indicator • Enrolled mostly in academic courses indicator • Enrolled mostly in workforce courses indicator • First term enrolled in VCCS indicators • Ever was a remedial student indicator Employment history (for all participants) • Employed in selected quarters indicators

Note: Characteristics marked with an asterisk (*) are available only for VCCS students and are measured at time of first college enrollment. Other (time-varying) measures such as age are captured when an individual becomes a participant, and for VCCS students, (participants and nonparticipants) on first college enrollment.

[a] For characteristics, total credits are those accumulated prior to becoming participants; for intermediate outcomes, they are those accumulated during the study period. Total credits until spring 2012 are used as a control in the regression analysis on outcomes.

Defining health and E-health programs. We used the 2010 Classification of Instructional Programs (CIP) two-digit taxonomy to code academic plans and credentials obtained and interpret the code of 51 as an indicator of a health program of study. Given the grant focus, students expressing interest or obtaining credentials in E-health were a primary interest. We identified E-health academic plans and credentials using a combination of program name, code, college, and date following Tidewater Community College's list of E-health programs funded by the grant as of April 2015.

Research topic 2: Describing program activities

We used the strategy case management data to describe the 21 activities participants could undertake, in addition to the three activities required to become participants (see Chapter III, Table III.1). We described individual activities using the most recent list of program activities to

reflect the latest program conventions.[12] We used the analytic techniques and tests presented in research topic 1 to describe the frequency of activities undertaken, the most prevalent activities, and the differences in activities between those who were and were not VCCS students when they became participants.[13]

Research topic 3: Describing intermediate outcomes

We used registrar data to describe intermediate outcomes of participants (Table A.4). We used the analytic techniques and tests presented in research topic 1 to describe the frequency of intermediate outcomes and the differences in intermediate outcomes between those who were and were not VCCS students when they became participants.

Table A.4. Intermediate outcomes

Education (at VCCS)
• Enrollment • Total credits (attempted and passed) • Credit course passing rate • Total workforce courses attempted • Enrollment in a (credit or noncredit) E-health TAACCCT-funded course

Research topic 4: Describing outcomes and associations with them for VCCS students who participated in the program

We used registrar and UI data to describe outcomes and associations with them for VCCS students who participated in the coaching program. Registrar data captured educational outcomes as of fall 2014. We developed indicator variables for whether a student received a certificate, a career studies certificate, or an associate's degree (1 = had outcome, 0 = did not). UI records data captured employment and earnings outcomes by quarters since becoming a participant and in the third quarter of 2014—the last quarter of employment data available. We developed an indicator variable if a participant was employed (1 = employed, 0 = was not employed) and used quarterly earnings to measure labor market outcomes.

We used the analytic techniques described for research topic 1 to describe outcomes for all participating VCCS students and estimated an ordinary least squares (OLS) regression to identify the activities associated with education and labor market outcomes using the following model:

$$(1)\ Y_{ict} = \alpha^1 + \beta^1 Activity\_Type_{ic} + \delta^1 X_{ic} + \varphi^1 Z_{ic} + \theta_c^1 + \varepsilon_{ict}^1,$$

where Y_{ict} is an educational or labor market outcome for participant i in college c at time t; $Activity\_Type_{ic}$ is an vector of indicators for each activity tier (core, intensive, and training as described in Chapter III, Table III.1), which is equal to 1 if student i engaged at least one activity

[12] Over the course of the program, some activities were combined for reporting in the strategy case management system: (1) education and workplace readiness (code 220) and short term pre-vocational services (code 215); (2) referral to supportive services (code 133) and referral to partner (code 244); (3) assessment of skills and service needs (also known as objective assessment) (code 203) and career assessment (code 243); (4) apprenticeship training (code 314) and referral to apprenticeship (code 206); (5) experiential learning opportunities (code 364), internships (code 218), and work experience (code 219).

[13] We capture unique activities and not their intensity, because conversations with VCCS research and program leads suggested that coaches recorded intensity of activities differently (Sullivan et al. 2015).

of that type and equal to zero otherwise; X_{ic} is a vector of characteristics (Table A.3); Z_{ic} is a vector of the student's academic and employment history (Table A.3); θ_c are college fixed effects[14]; and ε_{ist} is the error term. We calculated Huber-White standard errors that are robust to heteroskedasticity of the error term (Huber 1967; White 1980) and included indicator variables to account for missing values on variables to avoid loss of sample due to missing data. Education outcomes are measured at *t* = fall 2014 and employment and earnings outcomes are measured at *t* = 2014, quarter 3. This analysis considers only activities undertaken before fall 2014, because earlier outcomes could have influenced the outcomes. We present results as marginal effects; that is, the change in the predicted probability of the outcome associated with undertaking a particular type of activities, net of the effect of undertaking other types of activities and participants' characteristics.

The coefficients of interest are the $\beta^1 s$, which indicate how each type of activity is related to each outcome. Statistically significant coefficients identify activities that are likely associated with outcomes, with the size of the coefficient indicating the magnitude of the association. Because we include employment in the quarter before participation as one of the control variables in the estimation, the estimated β with an employment outcome shows the association with changes in employment after participation.

Research topic 5: Comparing outcomes between VCCS students who participated in coaching participants and other students (the comparison group)

We used the analytic techniques described for research topic 1 to compare the outcomes for VCCS students who were participants and students who were not participants (the comparison group) and used an OLS regression to estimate differences in outcomes between participants and other students in the same college while controlling for some of the observable differences between them in characteristics, and academic and employment histories. We estimated the following model:

(2) $Y_{ict} = \alpha^2 + \beta^2 Coach_{ic} + \delta^2 X_{ic} + \varphi^2 Z_{ic} + \theta_c^2 + \varepsilon_{ict}^2$.

In this model, $Coach_{ic}$ is an indicator of participation in coaching and is equal to 1 if student i was a participant and 0 if not. Other variables are defined above. As with the estimation of Equation (1), we calculated Huber-White standard errors, included indicator variables to account for missing values on variables, and measured education outcomes at *t* = fall 2014 and employment and earnings outcomes at *t* = 2014, quarter 3. The coefficient of interest is β^2 as it indicates the average difference between participants and nonparticipants in the same college controlling for observed differences between the two groups.[15] We present results as marginal effects for employment and the raw (unadjusted) average outcomes for the comparison group and the regression-adjusted treatment group mean, using as the sum of the comparison group mean and the estimated impact. This presentation is consistent with the reporting of impact estimates at the Institute of Education Sciences, U.S. Department of Education.

[14] We consider J. Sargeant Reynolds and John Tyler as one fixed effect term, because they run a joint program.

[15] Available data does not indicate whether comparison group students took coaching activities, only that they did not complete the three required activities.

APPENDIX B:

DETAILED DATA TABLES

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This appendix contains data tables that underlie many of the figures and tables in the text. Section A presents data tables developed for Chapter II (B.1 to B.6), Section B presents data tables for Chapter III (B.7 to B.11), and Section C presents data tables for Chapter IV (B.12 to B.17).

We used the following guidelines when developing the tables in this appendix:

- The list of acronyms defines the abbreviations used in the tables.
- We used strategy case management data to define participants in all tables. We present other data used in the source notes of the tables.
- Item-specific nonresponse reduces the number of participants in some cells, except in the tables presenting results of multivariate estimations. Appendix A, Table A.2 provides estimates of the magnitude of the reduction.
- We used a two-tailed *t*-test for the difference of means of continuous variables and a chi-squared test for differences in distributions for categorical variables. All tests adjust for clustering at the college level. Tables use an asterisk (*) to indicate statistically significant differences ($p \leq 0.05$).
- Participation was determined by the term in which individuals completed the third activity required to be considered program participants.
- VCCS students who were participants had taken a credit or noncredit course prior to becoming a participant.
- Earnings are reported for those employed when describing participants' outcomes and employment history, but were imputed to be zero for those unemployed in multivariate analysis.

A. Supplemental findings on program participants for Chapter II

Table B.1. Participants by college

College	Participants		2014–2015 Head count		Percentage participants over percentage head count
	Number	Percentage	Number	Percentage	
Paul D. Camp	852	13	1,813	0.7	18.6
Central Virginia	445	7	6,414	2.4	2.9
New River	462	7	6,617	2.5	2.8
Wytheville	448	7	4,305	1.6	4.4
Southside Virginia	421	6	7,350	2.8	2.1
Southwest Virginia	417	6	3,566	1.4	4.3
Tidewater	403	6	39,531	15.1	0.4
J. Sargeant Reynolds/John Tyler	340	5	31,495	12.0	0.4
J. Sargeant Reynolds	n.a.	n.a.	17,742	6.8	n.a.
John Tyler	n.a.	n.a.	13,753	5.2	n.a.
Blue Ridge	307	5	6,039	2.3	2.2
Lord Fairfax	330	5	9,427	3.6	1.4
Patrick Henry	354	5	3,783	1.4	3.6
Virginia Western	344	5	12,798	4.9	1.0
Danville	257	4	5,554	2.1	1.9
Piedmont Virginia	254	4	7,673	2.9	1.4
Thomas Nelson	190	3	15,122	5.8	0.5
Eastern Shore	143	2	1,131	0.4	5.0
Germanna	166	2	10,012	3.8	0.5
Mountain Empire	146	2	3,620	1.4	1.4
Rappahannock	117	2	4,616	1.8	1.1
Northern Virginia	89	1	76,044	29.0	0.0
Dabney S. Lancaster	67	1	1,848	0.7	1.4
Virginia Highlands	98	1	3,315	1.3	0.8
Missing cases	2	0	n.a.	n.a.	n.a.
Total	**6,652**	**100**	**262,073**	**100**	**n.a.**

Source: Strategy case management data for participants and [http://www.vccs.edu/about/where-we-are/impact/vccs-annual-enrollment/] for 2014–2015 enrollments.

Note: Program data for J. Sargeant Reynolds and John Tyler community colleges are combined because they run a joint program. Table includes individuals that became a new participant from fall 2012 to spring 2014. Not all participants are college students.

Table B.2. Participants' characteristics (percentages unless noted)

	All participants	VCCS student when becoming a participant	Not VCCS student
Demographics			
Female	61	62	57
Age			
Average	36	33*	41
Age is less than 25	30	36*	16
Age is 25 or more	70	64*	84
Race			
White, non-Hispanic	59	63*	50
Black, non-Hispanic	34	30	43
Hispanic	3	3	4
Asian	1	1	1
Other race	3	3	2
Target populations			
Veteran (ever)	6	5*	8
WIA client (ever)	24	25	22
TAA participant (ever)	7	7	6
Number of participants	**6,652**	**4,506**	**2,146**

Source: Strategy case management, WIA case management, and registrar data.

*Difference between VCCS student when becoming a participant and not VCCS student is statistically significant at the 0.05 level, two-tailed test. For race, the test is for the entire distribution.

Table B.3. Characteristics of individuals who were VCCS students when becoming participants (percentages unless noted)

	VCCS student when becoming a participant
Characteristics	
Pell grant recipient (ever)	54
Parental education	
High school or less	51
Some college	19
Associate's degree	10
Bachelor's degree	12
Some graduate or more	8
Academic history	
Degree-seeking student when becoming a participant	72
Enrolled full time	32
Dual enrollment student (ever)	10
Remedial student (ever)	42
Total credits accumulated (average)	23
Less than 9	39
9 to 29	31
30 to 59	18
60 to 63	2
64 to 69	2
Employment history	
Employed	
One quarter prior to participation	42
Two quarters prior to participation	42
Earnings (for those working)	
One quarter prior to participation	$3,674
Two quarters prior to participation	$3,950
Number of participants	**4,506**

Source: Registrar and UI record data.

Table B.4. Academic plans for participants who were VCCS students

Academic plans	VCCS student when becoming a participant	Percentage
Health programs	**1,001**	**22**
E-health TAACCCT programs	9	
Career studies certificates	6	
Certificates	2	
Transfer degree	1	
Other health programs	992	
Non health programs	2,554	57
Workforce student (that is, academic plan not applicable)	951	21
Total	**4,506**	**100**

Source: Registrar data.

Note: E-health programs are TAACCCT-funded credit programs. Other Health Programs are non-TAACCCT-funded credit programs with a Classification of Instructional Programs (CIP) of 51.

Table B.5. E-health academic plans for VCCS students when becoming participants

E-health academic plans	College	Number participants reporting E-health academic plan	Percentage
Career studies certificates			
Medical coding–hospital	Blue Ridge	3	33
Medical coding	New River	2	22
Health records coding	Virginia Western	1	11
Certificates			
E-health science	Virginia Highlands	2	22
Transfer degree			
Associate of applied science in nursing	Rappahannock	1	11
Total		**9**	**100**

Source: Registrar data.

Table B.6. Characteristics of participating and nonparticipating VCCS students (percentages unless noted)

	VCCS student participant	VCCS student nonparticipant
Demographics		
Female	63	57
Age	32*	28
Race		
White, non-Hispanic	62*	56
Black, non-Hispanic	30	24
Hispanic	3	9
Asian	1	6
Other race	3	5
Parental education (highest)		
High school or less	51*	33
Some college	19	19
Associate's degree	9	10
Bachelor's degree	12	22
Some graduate or more	8	16
Populations of interest		
Veteran (ever)	7*	4
Pell grant recipient (ever)	65*	36
Academic history		
Dual enrollment student (ever)	11	9
Full-time student at first college enrollment	39	33
Remedial student (ever)	51*	42
Total credits accumulated until spring 2012	11	11
Reported an academic plan that is a TAA-funded program (ever)	1	1
Employment history		
Employed		
Employed in 2012 quarter 1	48	50
Employed in 2012 quarter 2	50	54
Employed in 2012 quarter 3	51	56
Earnings (for those working)		
Earnings in 2012 quarter 1	$4,162*	$5,330
Earnings in 2012 quarter 2	$4,074*	$5,160
Earnings in 2012 quarter 3	$3,966*	$5,114

Table B.6 (continued)

	VCCS student participant	VCCS student nonparticipant
First college enrollment term		
Fal l 2008	6*	9
Spring 2009	3	3
Summer 2009	1	2
Fall 2009	5	5
Spring 2010	3	3
Summer 2010	2	2
Fall 2010	6	7
Spring 2011	3	3
Summer 2011	3	2
Fall 2011	8	9
Spring 2012	0	0
Summer 2012	5	6
Fall 2012	15*	19
Spring 2013	10	9
Summer 2013	6	7
Fall 2013	16	16
Academic plan on first college enrollment (top five field of studies)		
Liberal arts and sciences, general studies, and humanities	27	26
Student has not declared a major	8*	19
Health professions and related programs	26*	13
Business, management, marketing, and related support services	12	12
Multi/interdisciplinary studies	2*	6
2012 unemployment rate in zip code of first enrollment	3*	2
Participant exited the program	76	n.a.
Number VCCS students	**3,329**	**296,595**

Source: Strategy case management, WIA case management, registrar data, UI record data, 2012 local area unemployment data.

*Difference between groups is statistically significant at the 0.05 level, two-tailed test. For race and parental education, the test is for the entire distribution.

B. Supplemental findings on program activities for Chapter III

Table B.7. Participants' take-up of activities (percentages unless noted)

	All participants	VCCS student when becoming a participant	Not VCCS student
Required	**100**	**100**	**100**
Initial assessment	100	100	100
Career guidance/planning	100	100	100
Wizard activation	100	100	100
Core	**60**	**61**	**58**
Job search/career coaching	44	46	42
Orientation	29	29	29
Job search workshop	8	8	8
Referral to supportive services	3	2*	4
Job finding club	2	1	3
Intensive	**37**	**39**	**31**
Wizard assessment	18	18	19
Education and workplace readiness	15	18*	7
Assessment of skill levels and service needs	4	4	4
Referral to experiential learning	2	2	2
Career readiness certificate preparation	1	2	1
Computer literacy	1	1	2
Reading and math testing	1	1	2
English as a second language	0	0	0
Training	**16**	**19***	**10**
Experiential learning	12	14*	6
Industry certification training	3	3	2
Training program	2	2	3
State licensure training	1	2	0
On-the-job training	0	0	0
Entrepreneurial training	0	0	0
Apprenticeship training	0	0	0
Recertification training	0	0	0
Number participants	**6,652**	**4,506**	**2,146**

Source: Strategy case management data.

Note: Table does not display activities with less than one percent take-up rate.

*Difference between VCCS student when becoming a participant and not VCCS student is statistically significant at 0.05 level, two-tailed *t*-test.

Table B.8. Activity take-up by characteristics (percentages unless noted)

	Age		TAA		WIA		Veteran	
	Less than 25	25 or more	Yes	No	Yes	No	Yes	No
Required	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Initial assessment	100	100	100	100	100	100	100	100
Career guidance/planning	100	100	100	100	100	100	100	100
Wizard activation	100	100	100	100	100	100	100	100
Core	**60**	**60**	**59**	**60**	**55**	**61**	**62**	**60**
Job search/career coaching	44	44	37	45	38*	46	41	45
Orientation	28	29	31	29	29	29	35	28
Job search workshop	9	8	8	8	8	8	6	8
Referral to supportive services	2	3	2	3	3	3	3	3
Job finding club	1	2	0	2	2	2	1	2
Intensive	**38**	**36**	**47**	**36**	**38**	**36**	**33**	**37**
Wizard assessment	17	18	21	18	19	18	17	18
Education and workplace readiness	20	12	10	15	12	16	9	15
Assessment of skill levels and service needs	4	4	10*	4	5	4	5	4
Referral to experiential learning	1	3	9	2	5	1	2	2
Career readiness certificate preparation	1	2	5	1	2	1	2	1
Computer literacy	0*	1	0	1	1	1	1	1
Reading and math testing	1	2	2	1	1	1	4	1
English as a second language	0	0	0	0	0	0	0	0
Training	**18**	**16**	**25**	**16**	**21**	**15**	**16**	**16**
Experiential learning	14	10	19	11	12	11	7	12
Industry certification training	2	3	3	3	6*	2	5	3
Training program	2	2	5	2	4*	2	3	2
State licensure training	2	1	0	2	0	2	0	2
On-the-job training	0	0	0	0	0	0	0	0
Entrepreneurial training	0	0	0	0	0	0	0	0
Apprenticeship training	0	0	0	0	0	0	0	0
Recertification training	0	0	0	0	0	0	0	0
Number participants	**1,972**	**4,669**	**458**	**6,194**	**1,591**	**5,061**	**417**	**6,235**

Source: Strategy case management data.

Note: Table does not display activities with less than one percent take-up rate.

*Difference between groups is statistically significant at the 0.05 level, two-tailed *t*-test.

Table B.9. Total number of activities undertaken

Percentage of participants undertaking…	All participants	VCCS student when becoming a participant	Not VCCS student
Three activities (that is, the three required)	23	21	28
Four activities	33	32	34
Five activities	27	29	24
Six activities	10	10	9
Seven or more	7	7	6
Average number of activities	4	5	4
Range	[3, 13]	[3, 13]	[3, 13]
Number participants	**6,652**	**4,506**	**2,146**

Source: Strategy case management data.

Note: The distribution of activities between VCCS students when becoming a participant and those who are not is not statistically significantly different at 0.05 level, two-tailed test.

Table B.10. Number activities undertaken by term becoming a participant

Percentage of participants undertaking…	Fall 2012	Spring 2013	Summer 2013	Fall 2013	Spring 2014
Three activities (that is, the three required)	18	14	26	30	29
Four activities	29	31	34	31	38
Five activities	26	30	27	28	25
Six activities	15	14	8	7	5
Seven or more	12	12	5	4	3
Average number of activities	5	5	4	4	4
Range	[3, 11]	[3, 13]	[3, 11]	[3, 10]	[3, 10]
Total number	**670**	**1,821**	**1,133**	**1,699**	**1,329**

Source: Strategy case management data.

Table B.11. Participants' intermediate outcomes (percentages unless noted)

	All participants	VCCS student when becoming a participant	Not VCCS student
Enrolled in VCCS after participation	42	51*	22
Total credits attempted (average)	25	36*	3
Total credits passed (average)	21	30*	3
Credit course passing rate (if credits attempted)	77	78	75
Total workforce courses attempted (average)	1	2*	0
Took an E-health TAACCCT-funded course	2	3*	1
Credit course	2	3*	0
Workforce course	1	1	0
Number participants	**6,652**	**4,506**	**2,146**

Source: Registrar data.

*Difference between VCCS student when becoming a student and not VCCS student is statistically significant at 0.05 level, two-tailed *t*-test.

C. Supplemental findings on outcomes for Chapter IV

Table B.12. Education outcomes for VCCS students by term becoming a participant (percentages unless noted)

	VCCS student participant	Fall 2012	Spring 2013	Summer 2013	Fall 2013
Level completed	**27**	**33**	**35**	**21**	**19**
Career studies certificate	11	15	13	9	8
Certificate	7	7	10	5	6
Associate's degree	15	19	22	11	9
No degree but enrolled in a credit course in spring 2014	39	28	26	41	55
Number participants	**3,329**	**454**	**1,132**	**686**	**1,057**

Source: Registrar data.

Table B.13. Certificate or career studies certificates field of study for participating VCCS students

Field of study	Number of participating VCCS students with a certificate or CSC	Percentage
Health	**228**	**40**
E-health TAACCCT-funded	6	
Career studies certificates	5	
Certificates	1	
Other health	222	
Nonhealth	**416**	**60**
Total	**683**	**100**

Source: Registrar data.

Note: Field of study is based on the 2010 Classification of Instructional Programs (CIP). Degrees in health are those under CIP code 51. Participants holding multiple certificates are counted as having a TAACCCT-funded E-health degree if they have at least one such degree. Participants with multiple nonhealth fields of studies are counted accordingly to the first degree obtained.

Table B.14. TAACCCT-funded E-health degrees for participating VCCS students

E-health TAACCCT-funded degrees	College	Number of participating VCCS students with an E-health degree	Percentage
Career studies certificates			
Medical coding	New River	3	50
Medical coding–hospital	Blue Ridge	1	17
Electronic records systems engineering	Paul D. Camp	1	17
Certificates			
E-health science	Virginia Highlands	1	17
Total		**6**	**100**

Source: Registrar data.

Table B.15. Employment outcomes for participating VCCS students

Quarter since becoming participant	Employed (percentage)			Earnings (average)		
	VCCS participant	Enrolled in college	Not enrolled in college	VCCS participant	Enrolled in college	Not enrolled in college
Quarter 1	58	52*	67	$3,661	$3,071*	$4,245
Quarter 2	62	56*	69	$3,981	$3,290*	$4,739
Quarter 3	64	55*	69	$4,202	$3,709*	$4,414
Total number	**3,329**	**n.a.**	**n.a.**	**3,329**	**n.a.**	**n.a.**

Source: UI record data.

*Difference between enrolled and not enrolled in college is statistically significant at the 0.05 level, two-tailed test

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Table B.16. Associations between type of activities and outcomes for participating VCCS students

	Education outcomes			Labor market outcomes	
	CSC	Certificate	Associate	Employed 2014, quarter 3	Earnings 2014, quarter 3
Type of program activity (marginal effect)					
Core	3*	0	3	4*	276*
Intensive	0	5*	0	3*	105
Training	5*	-5*	8	5*	177
Controls					
Characteristics	yes	yes	yes	yes	yes
College fixed effects	yes	yes	yes	yes	yes
Mean outcome	11	7	15	68	3,045
R^2	0.11	0.18	0.38	0.17	0.22
F-test of joint significance [p-value]	[0.00]	[0.95]	[0.00]	[0.00]	[0.01]
Number participating students	**3,329**	**3,329**	**3,329**	**3,329**	**3,329**

Source: Strategy case management, WIA case management, registrar, UI record, and 2012 local area unemployment data.

Note: Activities are restricted to those undertaken on or before summer 2014. Regression controls for the full set of variables shown in Appendix B, Table B.6.

*Association between type of activity and outcome is statistically significant at the 0.05 level, two-tailed test.

Table B.17. Associations between program participation and outcomes

	Education outcomes			Labor market outcomes	
	CSC	Certificate	Associate's degree	Employed in 2014, quarter 3	Earnings in 2014, quarter 3
Program participant (marginal effect)	2*	-1*	4*	4*	$-217
Controls					
Characteristics	yes	yes	yes	yes	yes
College fixed effects	yes	yes	yes	yes	yes
Mean outcome for VCCS nonparticipants	4	6	12	60	$3,506
R^2	0.08	0.15	0.31	0.26	0.51
Number students	**299,924**	**299,924**	**299,924**	**299,924**	**299,924**

Source: Strategy case management, WIA case management, registrar, UI record, and 2012 local area unemployment data.

Notes: Regression controls for the full set of variables shown in Appendix B, Table B.6.

*Association between participation and outcome is statistically significant at 0.05 level, two-tailed *t*-test.

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