Noncredit Workforce Training at Community Colleges: Participant Composition and Academic Success

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I. Introduction

With rapid technological advances, the labor market increasingly exhibits a need for more frequent, ongoing skill development (Carnevale, Smith, & Strohl, 2010; Deming & Noray, 2020). Employers in many fields encounter difficulties finding adequately trained workers to satisfy their labor demand. The pandemic has only exacerbated these gaps, with eleven million job openings and six million unemployed workers as of the end of January 2023 (US Bureau of Labor Statistics, 2023). Accordingly, the federal and state governments increasingly prioritize workforce training in their policy agendas, such as in the case of the Biden Administration's Talent Pipeline Challenge that supports partnerships between employers and training providers to build the workforce pipeline.

Community college noncredit Career and Technical Education (CTE) programs play an essential role in workforce development by providing workers with the skills they need to compete for high-demand positions within a short span of time. These noncredit offerings are typically skill-based training programs designed to lead to a specific occupation, such as commercial truck-driving, welding, or nursing assistance. According to a recent report by the American Association of Community Colleges (2018), approximately five million noncredit students enrolled in community colleges nationally, which represents 41 percent of total enrollment at two-year institutions.

Despite the indispensable role of noncredit CTE programs in the national economic landscape, noncredit programs are typically not included in state and national postsecondary datasets (D'Amico et al., 2017). Correspondingly, we know very little about the composition of students who participate in these programs, the rates at which students complete programs and earn workforce-relevant credentials, and whether CTE program participation leads to subsequent education and training or improved workforce outcomes.

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This report presents initial findings from a comprehensive study being undertaken to examine noncredit CTE programs offered within the Virginia Community College System (VCCS). In 2016, the Virginia legislature, through HB66, passed legislation to expand participation in community college noncredit CTE programs. These programs are commonly known in Virginia as "FastForward" programs. A key component of this initiative is an innovative funding mechanism, the New Economy Workforce Credential Grant (WCG), which is a cost-sharing pay-for-performance model (described in more detail below). The programs covered under this initiative are those that lead to an industry-recognized credential in a high-demand field; our analyses focus on this subset of eligible "FastForward programs."

We capitalize on this data to generate additional robust evidence about the academic and labor market outcomes of students enrolled in FastForward programs. In this report, we focus on our analyses related to participant composition, program success, and the relationship between non-credit and credit enrollment. In future reports, we will present evidence about the labor market impacts of FastForward participation and the impact of Virginia's unique pay for performance model for funding noncredit CTE programs.

Below, we provide a high-level overview of preliminary patterns that emerged from our analysis.

- Compared with short-duration career technical training programs offered by the credit-bearing sector in Virginia's community colleges, FastForward programs serve a substantially larger proportion of male and Black students.
- The average program completion rate for FastForward is 93.7 percent, and about two-thirds of the students enrolled in FastForward received an industry-recognized credential within six months of program completion.
- *Program completion* is consistently high across all programs and subgroups of students. In contrast, underlying overall high *industry-recognized credential attainment rates* is important variation between programs and student groups in credentialing. In general, female and Black students tend to have lower credential attainment rates than their male and White counterparts do. These gaps are partly driven by students' differential sorting into programs with higher or lower average credential attainment rates.
- Only 13.3 percent of FastForward students ever embarked on a credit-bearing program after their initial FastForward enrollment, suggesting that relatively few students use noncredit CTE as a springboard for training in credit-bearing programs.
- Approximately one third of students enrolled in FastForward had a history of enrollment in the credit sector prior to enrolling in a FastForward program. Among these students, roughly 20% ever received any postsecondary credentials from a credit-bearing program prior to their FastForward enrollment spell, suggesting that one function of the FastForward program has been to provide workforce skill building and credentialing opportunities for students already possessing postsecondary experiences but lacking a credential.
- Analysis on enrollment patterns indicates that the vast majority of FastForward enrollees only enrolled in one FastForward program.

II. State Context

The present study is being carried out within the purview of the Virginia Community College System (VCCS), a system of 23 institutions with 40 campuses located throughout the Commonwealth of Virginia. The VCCS colleges offer a diverse array of options, including large, comprehensive college transfer programs to smaller, specialized, employer focused courses, and are situated in a range of geographic settings, including rural, suburban, and urban areas. In comparison to the national average of students enrolled in two-year colleges, the VCCS student body is disproportionately rural and White.

Noncredit CTE in the VCCS. VCCS has a long-standing commitment to providing noncredit CTE opportunities to its students. Prior to 2016, limited statewide guidance about the quality and goals of noncredit programs was available, and many programs lacked the validation of third-party industry credentials. In response to the increasing demand for skilled workers to fill available and emerging jobs in the Commonwealth, the General Assembly passed House Bill 66 during the 2016 session with the goal of creating and sustaining a demand-driven supply of credentialed workers for high-demand occupations in the commonwealth through "FastForward" programs. HB 66 also led to the systematic, statewide collection of student-level noncredit CTE data on program enrollment, program completion, credential attainment, and labor market data.

A key component of the FastForward initiative is the New Economy Workforce Grant Program (WCG). The WCG funds FastForward programs which are designed to be short-term, typically lasting between 6 and 12 weeks, that incorporate a combination of classroom instruction and hands-on skill demonstrations. Each FastForward program is designed to prepare students to earn a specific workforce credential that is a competency-based, industry-recognized, and third-party-validated certification or occupational license.[3] For example, one of the most popular FastForward programs, Nurse Aid meets the Virginia Board of Nursing's requirement for Nurse Aide Training. Graduating students from the Nurse Aide program are eligible to take the national Nurse Aide Assessment Program (NNAAP) exam required by the Virginia Board of Nursing. Upon passing the NNAAP exam, students are awarded the Certified Nursing Assistant (CNA) credential, which certifies them as qualified nursing assistants and demonstrates their ability to provide quality care to patients.[4] Some of the credentials are also stackable on skills and connect to additional possible training and credential pathways in credit-bearing programs. For example, a student might complete a FastForward Manufacturing Technician program, and later enroll in a credit-bearing program to pursue a short-term certificate in Mechanical Maintenance and further pursue an Associate degree in Technical Studies.[5]

The WCG provides a unique pay-for-performance model for funding noncredit workforce training that leads to an industry credential in one of the high-demand fields designated by the

[3] Considering that these credentials are provided by organizations outside of the traditional educational system, we refer to them as "industry credentials" in this report to distinguish it from college credentials (such as certificates or college degrees) that are awarded by a postsecondary institution.

[4] The CNA credential is recognized across the United States and is often a requirement for individuals seeking employment as nurse aides in long-term care facilities.

[5] More detailed information about sample stackable credentials and career pathways can be found at Virginia's FastForward website: https://fastforwardva.org/career-mapping/sample-career-pathway-in-manufacturing/

Virginia Board for Workforce Development. To be eligible for the WCG, colleges must show that the third-party industry credential is in demand in their region, and all programs must be approved by the State Board for Community Colleges.[6]

The specific amount of funding offered by the WCG is contingent upon student performance. Upon enrolling, eligible students are required to pay only one-third of the total program cost, which was an average of $691 in 2021.[7] This makes the program a reasonably affordable option for students who want to upgrade their skills or acquire new ones. In addition, students enrolled in FastForward programs may also receive additional funding from state sources, depending on their financial need and the program they are enrolled in.[8] This further reduces the cost for individual students, making the programs even more accessible.

If a student completes the program, the state and the training institution share the remaining two-thirds of the cost evenly. In other words, the total cost is split equally between the state, the student, and the training institution. If the student successfully completes the program and earns the industry-recognized credential within six months of completing the program, the state will fully reimburse the training institution for the remaining two-thirds of the program cost. However, if the student does not complete the program, the student is required to pay another one third of the total cost to the training institution, and the state will pay nothing for the training.

III. Data and Sample

To provide descriptive information about noncredit participation, completion, industry credential attainment, and subsequent enrollment in credit-bearing programs, we conduct our analyses on 35,265 students enrolled in the FastForward workforce training program beginning in the 2017 fiscal year and extending through the 2021 fiscal year. The administrative data are able to track the enrollment records of students in our analytical sample until summer 2022. We include students enrolled in all FastForward programs regardless of whether the students are WCG eligible. However, more than three quarters of the students in the sample have received funding from WCG.

We use data from three sources: (i) VCCS administrative data including demographic and transcript information for students enrolled in any of the FastForward programs, which includes information about all workforce credentials a student received; (ii) students' enrollment records, transcript records, and degree attainment records from credit-bearing programs in the VCCS; and (iii) National Student Clearinghouse (NSC) data, which allows us to track the enrollment of

[6] Most, if not all, FastForward programs are WCG eligible.
[7] The student portion is capped at $1500.
[8] For example, if an individual enrolled in the FastForward program experiences financial hardship and is unable to pay the tuition fees, they may be eligible for Workforce Financial Assistance (FANTIC), which will provide coverage for a third of the program's cost, effectively absolving the student from any financial obligation for the training. To be eligible for FANTIC, the student's household income or that of a dependent student's parent must not exceed 200% of the national federal poverty level.

FastForward students in credit-bearing programs both within and outside of the VCCS starting in 2004.[9]

IV. Findings

A. Demographic Characteristics of FastForward Students

Table 1A shows the demographic characteristics of FastForward students in our analytical sample (N=35,265), broken down by cohort year (columns two to six). Student cohorts are identified by their first FastForward enrollment spell within the VCCS. For example, a student who enrolls in FastForward for the first time in the 2017 fiscal year (July 1, 2016-June 30, 2017) is part of the 2016-2017 cohort.

In regard to demographic characteristics, roughly 60% of FastForward students identify as male. White student enrollment rates range between 47 and 53 percent depending on cohort year; these rates experienced a decline between 2017-2018 and 2020-2021.[10] In contrast, student enrollment rates among Black students steadily increased between the 2016-2017 cohort (29 percent) and the 2020-2021 cohort (38 percent). Lastly, the average age of the sample is 35 years old, with more than two thirds of the students between the ages of 25 and 54. Table 1A also provides information regarding the total number of programs in which students enrolled; approximately three quarters of the students enrolled in only one FastForward program.

Table 1A. Characteristics of students enrolled in FastForward programs, by cohort year

	Total	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
	(1)	(2)	(3)	(4)	(5)	(6)
Gender						
Female	36.3%	35.5%	34.3%	36.1%	35.0%	39.6%
Male	59.6%	63.4%	61.8%	58.5%	59.8%	55.7%
Unspecified	4.1%	1.0%	3.9%	5.4%	5.2%	4.7%
Race						
White	49.4%	47.0%	53.4%	51.8%	50.3%	45.9%
Black	33.7%	28.7%	32.5%	33.9%	35.1%	37.7%
Hispanic	5.5%	4.9%	5.0%	4.9%	5.9%	6.6%
Asian	3.8%	3.2%	3.0%	4.6%	3.4%	4.5%
Other	7.6%	16.3%	6.2%	4.9%	5.3%	5.3%

[9] Accordingly, if a FastForward student further pursues education in a credit-bearing program, or had previously enrolled in a credit-bearing program, we are able to observe these enrollments. Note that VCCS offers noncredit programs that are not FastForward programs; these programs are typically less focused on skilled workforce training. We do not observe enrollment in these non-FastForward programs in our data. Similarly, we do not observe any noncredit enrollment prior to the start of FastForward.

[10] Less than 1 percent of the analytical sample have missing values for gender. 5,134 students, or approximately 14 percent of the analytical sample, have missing values for race. The percentages reported in Table 1A are based on students who had valid values for gender and race.

Age						
Mean (s.d.)	34.6 (12.3)	35.7 (12.2)	35.2 (12.2)	34.4 (12.5)	33.7 (12.3)	34.3 (12.0)
Below 24	23.3%	19.3%	21.4%	24.5%	26.8%	23.9%
25-55	70.2%	73.9%	71.7%	69.0%	67.0%	70.1%
55 +	6.4%	6.8%	6.9%	6.5%	6.1%	6.0%
FastForward Course enrollment						
1 course	77.1%	80.5%	77.2%	77.0%	73.5%	77.7%
2 courses	12.3%	10.0%	12.1%	12.6%	14.2%	12.4%
3 or more courses	10.6%	9.4%	10.7%	10.4%	12.3%	10.0%
N	35,265	6,450	6,084	7,454	6,961	8,316

Note. The data used to produce this table is structured at the student level. The number of observations therefore represents 35,265 unique students. Columns 2-6 represent cohort years. Cohorts are identified by students' first FastForward enrollment spell (using program start date) in VCCS. For example, a student who initially enrolls in a FastForward program in the 2017 fiscal year (July 1, 2016-June 30, 2017) is part of the 2016-2017 cohort. The gender category includes less than 1 percent missing. To calculate the proportion of students within each gender category, we removed the missing observations. "Other" race category includes Native American, Hawaiian, Multi-ethnic, and unspecified. The race category includes 14.6 percent missing. To calculate the proportion of students within each race category, we removed the missing observations. Age is determined at the start of participation in the FastForward sample. In the Below 24 category, 1.4% of the students are recorded as age 17 and below. Regarding program enrollment, we include unique programs of enrollment; if a student repeats a program, for example, we only include their initial enrollment spell.

For comparison, in Table 1B, we provide demographic characteristics among VCCS students enrolled in credit-bearing certificate programs, which typically take one year or less to complete. Comparisons between Tables 1A and 1B reveal three interesting patterns. First, the FastForward programs enroll a substantially larger proportion of male students, where the gender composition is almost flipped between the noncredit and credit sectors. Second, the racial composition is also noticeably different: FastForward programs serve a larger proportion of Black students than credit CTE programs. Finally, we see similar time trends for the 2020-2021 cohort, where White student enrollment experiences a noticeable decline in enrollment and Black student enrollment experiences a small increase. Our future analyses, which will include the 2021-2022 cohorts, will shed more light on whether this pattern (i.e. increased share of Black students) persists or is cohort/year specific. In future analyses, we will also make more direct comparisons of the demographic composition of students enrolled in similar types of programs in the noncredit and credit-bearing sectors (e.g. compare characteristics of credit-bearing and FastForward students enrolled in healthcare programs).

Table 1B. Characteristics of students enrolled in VCCS credit-bearing sector, by fall term

	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021
	(1)	(2)	(3)	(4)	(5)	(6)
Gender						
Female	62.4%	60.9%	61.3%	62.0%	61.8%	63.7%
Male	37.5%	39.0%	38.6%	37.8%	38.0%	36.1%
Unspecified	0.1%	0.0%	0.1%	0.2%	0.3%	0.3%
Race						
White	59.1%	60.6%	58.4%	55.5%	57.6%	55.6%
Black	25.1%	23.7%	24.1%	26.4%	24.9%	28.1%
Hispanic	6.8%	6.8%	7.7%	8.1%	7.7%	5.9%
Asian	3.9%	4.3%	4.7%	4.9%	4.7%	4.8%
Other	5.0%	4.7%	5.2%	5.2%	5.1%	5.7%
N	8,650	7,401	7,297	7,346	6,827	7,846

Note. The data used to produce this table was retrieved from the Virginia State Council for Higher Education website: https://research.schev.edu/info/Reports.Guide-to-the-Fall-Headcount-Enrollment-Reports. We include the percent of students enrolled in credit-bearing programs earning awards less than one year. To calculate the proportion of students within each race category, we removed the missing observations. Missing values range from 1% to 4% depending on the year.

B. FastForward Enrollment, Completion, and Credentialing

Table 2 presents information about FastForward enrollment and program completion overall, as well as separately by student-program enrollment in a given cohort (e.g., July 1, 2016-June 30, 2017). Likely driven by the financial incentives embedded in the pay-for-performance model of WCG, the FastForward program completion rate is fairly high. In the 2016-2017 cohort, for example, VCCS experienced 7,810 student-program enrollments and 91.5 percent of these enrollments earned a letter grade of "satisfactory" (S), indicating successful completion. Overall, program completion ranges from 91 to 95 percent, depending on the year.

Table 2. FastForward program enrollment and completion

Cohort	Student-program enrollments	Completed training
2016-2017	7,810	91.5%
2017-2018	8,164	93.0%
2018-2019	10,177	95.2%
2019-2020	10,331	94.8%
2020-2021	11,740	93.5%
Total	48,222	93.7%

Note. To produce this table, we use data structured at the student-program level. Each row represents enrollment in a cohort (enrollment between July 1, 2016-June 30, 2017 represents the 2016-2017 cohort). Students who withdrew from a program (0.7% of the sample) or do not have any grade for a program (0.4% of the sample) are excluded. Earning a grade of satisfactory indicates successful program completion.

Table 3 presents industry credential attainment among FastForward students. We use two measures to capture students' industry credential attainment. The first one, "Earned an industry credential within 6 months of initial program completion", examines whether a student earned a third party, industry-recognized workforce credential in the same field as their first FastForward program within six months of successfully completing the program and awarded a satisfactory grade. This measure provides some insights on how soon a student is able to receive a credential upon completing the first FastForward program enrolled. The second measure, "Ever earned an industry credential" examines whether a student ever received any third party, industry-recognized workforce credential in any field within the study period.

Overall, approximately two thirds of students in our sample received a credential within six months of program completion, and the average credential attainment rate is fairly consistent across cohorts. If we use the "ever earned an industry credential" definition, the credential attainment rate slightly increases by roughly four percentage points, to 69 percent. This indicates that among students who ever attained an industry credential, they typically received it within six months after successful program completion. Again, the WCG funding formula provides a possible explanation for these fairly high rates of credential attainment. Specifically, under the WCG funding formula, when students receive a credential within six months of program completion, the state provides two thirds of the cost to the training institution. This incentive could result in institutions taking a number of steps strongly encouraging students to take the credential exam within six months upon program completion.[11]

Table 3. FastForward industry credential attainment

Cohort	Unique students	Earned an industry credential within 6 months	Ever earned an industry credential
2016-2017	6,450	63.7%	65.2%
2017-2018	6,084	65.7%	67.3%
2018-2019	7,454	70.1%	71.6%
2019-2020	6,961	69.8%	71.7%
2020-2021	8,316	67.0%	68.4%
Total	35,265	67.4%	68.9%

Note. Data is structured at the student-level. Each row represents a cohort year. Cohorts are identified by students' first FastForward enrollment spell (using program start date) in the VCCS. For example, a student who initially enrolls in FastForward programs in the 2016-2017 fiscal year (July 1, 2016-June 30, 2017) is part of the 2016-2017 cohort. We use grade date to determine whether a student earned a credential within 6 months of their initial FastForward enrollment. Ever earned a credential indicates whether a student ever earned any credential within the study period.

[11] Conversations with administrators at VCCS indicate that in some programs, the examination is included as part of the program, as the instructors are certified to conduct the exam. In many cases, though, the student must share proof of examination with the college after the program is completed. Some colleges are diligent in working with the student to get the proof.

C. Enrollment, Completion, and Credentialing by Subgroups

Tables 4 and 5 show FastForward enrollment, program completion, and industry credential attainment for subgroup populations of students. Table 4 indicates that program completion is consistently high across all subgroups. The most prominent difference in program completion rates is between White and Black students (95 percent versus 91 percent).

Table 4. FastForward participation & program completion, by subgroups

	Enrollment	Course completion
Gender		
Female	14,922	92.2%
Male	31,316	94.5%
Unspecified	1,962	93.5%
P-value		0.00
Race		
White	22,091	95.2%
Black	12,407	91.3%
Hispanic	2,137	94.5%
Asian	1,590	96.3%
Other	3,062	93.6%
P-value		0.00
Age		
Below 24	11,724	93.9%
25-55	33,316	93.6%
55 +	3,182	94.4%
P-value		0.11

Note: To produce this table, we used data structured at the student-program level. The gender category includes less than 1 percent missing. To calculate the proportion of students within each gender category, we removed the missing observations. The race category includes 14.6 percent missing. To calculate the proportion of students within each race category, we removed the missing observations. "Other" race category includes Native American, Hawaiian, Multi-ethnic, and unspecified. Age is determined at the start of participation in the FastForward sample. In the Below 24 category, 1.4% of the students are age 17 and below. Earning a grade of satisfactory indicates successful completion. Students who withdrew from a program (0.7%) or do not have any grade for a program (0.4%) are excluded. P-value indicates significant differences between the means of the groups in the relevant category.

Table 5 shows a number of notable between-group differences in credential attainment. First, there is a gender gap in credential attainment: 72 percent of male students earned a credential within 6 months of grade date compared with 61 percent among female students. Credential attainment rate also varies noticeably among different racial groups. For example, the difference in credential attainment within 6 months between White students and Black students, the two groups that represent the majority of FastForward enrollment, is roughly fourteen percentage points (74 percent versus 60 percent). These gaps appear to be partly driven by students'

differential sorting into programs with higher or lower average credential attainment rates. We explore this possibility in more detail in the next section where we explore enrollment, completion, and credentialing for the top ten most common FastForward programs.

Table 5. FastForward industry credentials, by subgroups

	Unique students	Earned an industry credential within 6 months	Ever earned an industry credential
Gender			
Female	12,640	60.9%	61.8%
Male	20,728	72.0%	72.8%
Unspecified	1,444	75.3%	76.1%
P-value		0.00	0.00
Race			
White	14,724	73.8%	75.3%
Black	10,002	59.5%	61.3%
Hispanic	1,642	66.9%	67.9%
Asian	1,138	57.9%	59.2%
Other	2,258	69.0%	70.2%
P-value		0.00	0.00
Age			
Below 24	8,130	70.3%	71.5%
25-55	24,449	67.5%	69.1%
55 +	2,252	67.2%	69.1%
P-value		0.00	0.00

Note. Data is structured at the student-level. We use course end date to determine whether a student earned a credential within 6 months of their initial noncredit enrollment spell. The gender category includes less than 1 percent missing. To calculate the proportion of students within each gender category, we removed the missing observations. The race category includes 14.6 percent missing. To calculate the proportion of students within each race category, we removed the missing observations. "Other" race category includes Native American, Hawaiian, Multi-ethnic, and unspecified. Age is determined at the start of participation in the FastForward sample. In the Below 24 category, 1.4% of the students are age 17 and below. P-value indicates significant differences between the means of the groups in the relevant category.

D. Enrollment, Completion, and Credentialing for the Top Ten Programs

Table 6 shows enrollment and program completion for the top ten most common FastForward programs. The most common program, *Commercial Driver's License Class A Endorsement*, represents 36 percent of total FastForward enrollments over the course of the study period. Within this program, 93 percent of these enrollments earn a satisfactory grade, indicating successful program completion. There are some between-program variations in completion, despite the high overall completion rate. Among the top ten programs, *Core-Introductory Craft Skills* has the highest completion rate (97 percent) while *Certified Nurse Aide* and *VDOT Asphalt Field Level 2* have the lowest rate (89 percent).

Table 6. Ten most common FastForward programs, enrollment and program completion

	Enrollment		Completion Rate	
Program Name	Frequency	Percent	Frequency	Percent
Commercial Driver's License Class A Endorsement	8,645	36.3%	8,047	93.1%
Clinical Medical Assistant (NHA)	2,783	11.7%	2,587	93.0%
VDOT Asphalt Field Level 1	2,299	9.7%	2,131	92.7%
Certified Nurse Aide	2,109	8.9%	1,881	89.2%
VDOT Asphalt Field Level 2	1,824	7.7%	1,625	89.1%
Shielded Metal Arc Welding (SMAW)	1,460	6.1%	1,388	95.1%
Core-Introductory Craft Skills	1,335	5.6%	1,289	96.6%
CompTIA A+	1,311	5.5%	1,233	94.1%
Phlebotomy Technician (NHA)	1,091	4.6%	1,015	93.0%
VDOT Asphalt - Slurry Seal	947	4.0%	887	93.7%

Note: To produce this table, we used data structured at the student-program level. Earning a grade of satisfactory indicates successful program completion.

Table 7 presents industry credential attainment for each of the ten most common FastForward programs. Column 2 indicates whether a student earned an industry credential in the same field of the program within 6 months of grade date. Column 3 indicates whether a student earned an industry in the same field of the program at any time during the study period. Different from the high program completion rate shown in Table 6, there is much more pronounced between-program variation in industry credential attainment. Focusing on Column 2, 84 percent of students enrolled in the *Core-Introductory Craft Skills* program, for example, earned an industry credential within 6 months whereas only 17 percent of *CompTIA A+* students did. The between-program variations hold when we extend the credential attainment period beyond six months (Column 3).

Table 7. Ten most common FastForward programs, industry credential attainment

Program Name	Unique students	Earned an industry credential in the program within 6 months	Ever earned an industry credential in the program
	(1)	(2)	(3)
Commercial Driver's License Class A Endorsement	8,599	75.6%	77.9%
Clinical Medical Assistant (NHA)	2,770	80.3%	80.9%
VDOT Asphalt Field Level 1	2,193	77.1%	82.6%

Certified Nurse Aide	2,100	48.0%	51.6%
VDOT Asphalt Field Level 2	1,573	70.0%	77.9%
Shielded Metal Arc Welding (SMAW)	1,423	74.6%	75.2%
Core-Introductory Craft Skills	1,290	84.1%	86.1%
CompTIA A+	1,297	16.6%	17.7%
Phlebotomy Technician (NHA)	1,091	72.9%	73.3%
VDOT Asphalt - Slurry Seal	875	80.2%	85.3%

Note. Data is structured at the student-level. We used grade date to determine whether a student earned an industry credential within 6 months of their noncredit enrollment spell. Column 2 indicates whether a student earned a credential in the program within 6 months. Column 3 indicates whether a student earned an industry in the program at any time during the study period.

Given the pronounced variation in industry credential attainment across programs, the gender and race gaps in credential attainment shown in Table 5 might be partly driven by students sorting into different programs. To provide insights into this possibility, below we further break down top program enrollment, completion, and credential attainment by gender and by race.

Figure 1A shows enrollment and completion rates in the top 10 programs by male and female students respectively. As shown in the top figure, male and female students opt into very different programs. For example, 81 percent of student enrollments in the program *Commercial Driver's License Class A Endorsement* self-identify as male. Overall, the most popular programs for male students are commercial driving, construction, and welding; for females, the most popular programs are public health related programs.

The program completion rates (bottom figure) are fairly comparable between male and female students within most of the programs. Two notable exceptions are in *Shielded Metal Arc Welding (SMAW)* and *CompTIA A+*, where male completion rates are five to six percentage points higher than female students.

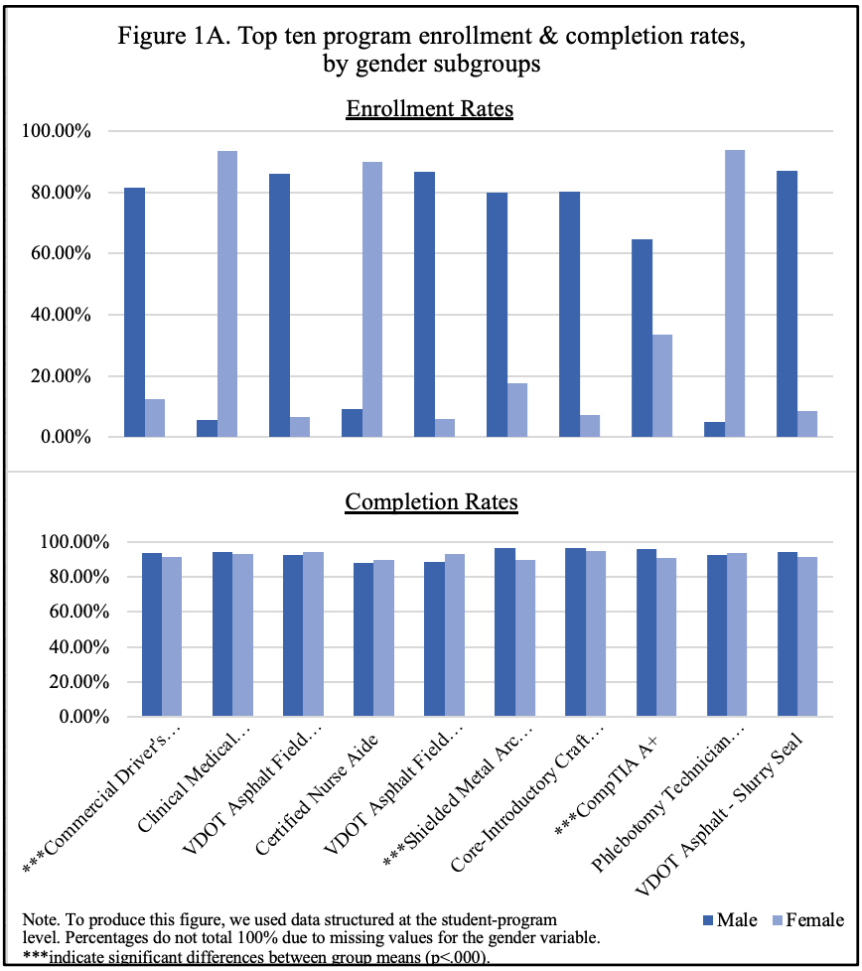


Figure 1B shows enrollment and completion rates in the top 10 programs by race. The top figure shows racial composition regarding enrollment and the bottom figure presents completion rates by race for each program. Black students are most represented in *Commercial Driver's License* (36 percent), *CompTIA A+* (37 percent), and *Certified Nurse Aide* (36 percent). Construction programs (the three VDOT Asphalt programs) appear to be least diverse among the top 10 programs, where White students make up close to 50 to 60 percent of student enrollments.

When it comes to program completion, the between-group and within-program differences are generally not stark. In *Certified Nurse Aide*, which is associated with the most noticeable between-group difference in program completion rates, the average completion rate among Black students is 86 percent, compared with 92 percent among White students, 90 percent among Hispanic, and 97 percent among Asian students.

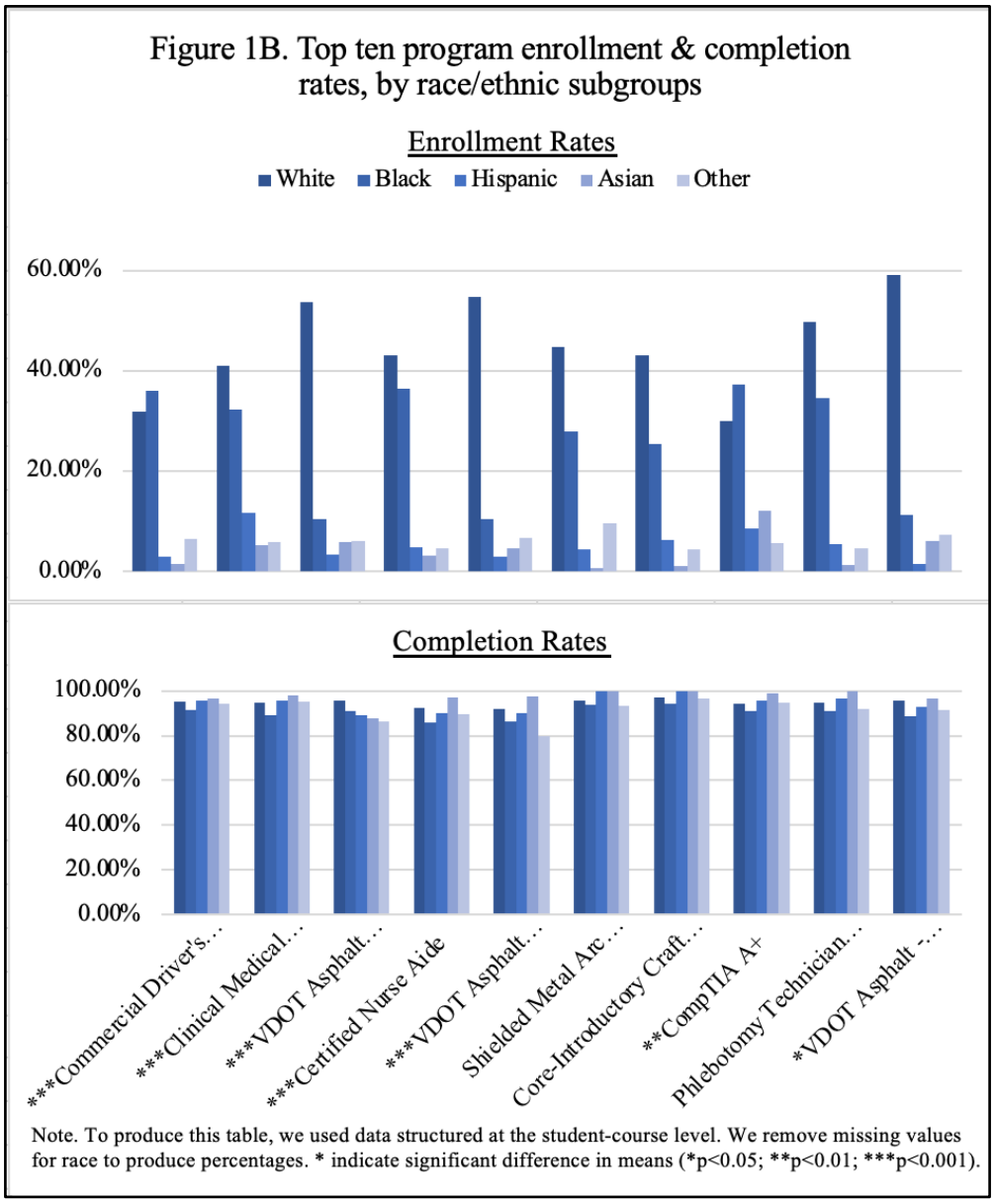
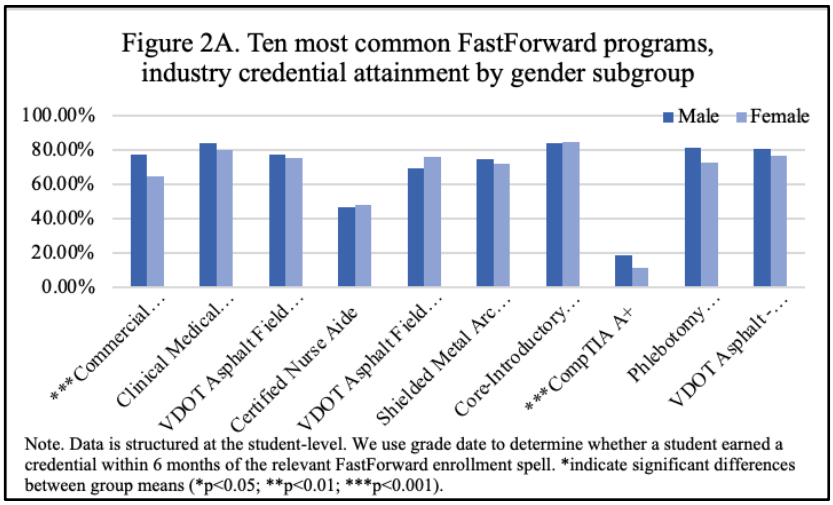
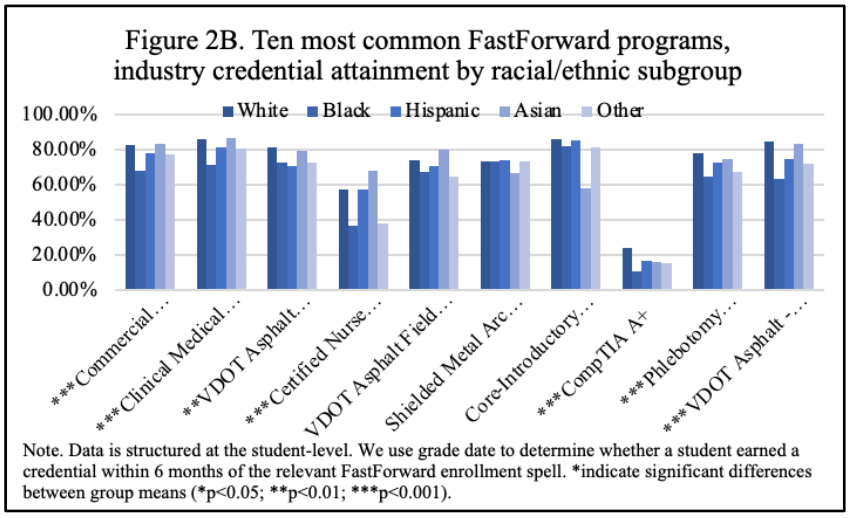


Figure 2A and 2B show industry credential attainment by subgroup populations of students for the ten most popular FastForward programs. Figure 2A presents credential attainment by gender and reveals two interesting patterns. First, male students had a comparable or higher credential attainment rate than female students in all 10 programs except for only two programs: *Certified Nurse Aide* (47 percent versus 48 percent), and *VDOT Asphalt Field Level 2* (69 percent versus 76 percent). Second, the most popular programs tend to be associated with relatively high credential attainment rate, except for *Certified Nurse Aide*, which is the second most popular program for females. Taken together, the gender gap in credential attainment rate shown in Table 5 seems to be driven by within-program gender gaps, as well as differential sorting into programs with higher or lower average credential attainment rates.

Figure 2B presents industry credential attainment by race, and shows pronounced racial gaps in each program. In the most popular program *Commercial Driver's License*, for example, the average credential attainment rate is 83 percent for White students, which is approximately 15 percentage points higher than Black students (68 percent).





E. Participation in Subsequent Credit-bearing Programs

Table 8 provides descriptive analysis of the number of FastForward students that enroll in the credit-bearing sector prior to or after FastForward enrollment. To fully capture the intersection between the noncredit and credit-bearing sectors, we break down students into four distinct categories: (1) FastForward students who never enrolled in any credit-bearing program either prior to or after their enrollment in FastForward programs; (2) FastForward students whose initial enrollment was in a FastForward program and who then enrolled in subsequent credit-bearing programs; (3) FastForward students with a history of enrollment in the credit sector and complete their postsecondary experience to date in FastForward; and (4) FastForward students who enrolled in the credit sector both prior to and after their FastForward enrollment. To provide a longer enrollment tracking period after FastForward program enrollment, we restrict our analyses to only the 2016-2017 and 2017-2018 cohorts of students. Note that for this analysis, we account for both VCCS and non-VCCS enrollment in the credit-bearing sector.

Among the students examined in our focal cohorts, the majority of them (61 percent) never enrolled in any credit-bearing program (category one) and the vast majority in this category (79.4%) only enrolled in one FastForward course and then left. Further, less than 3 percent who began their postsecondary experience in FastForward ever went on to enroll in a credit-bearing program (category two). Another 10.6 percent of FastForward students had both prior and subsequent enrollment in the credit sector (category four). Among these two categories of students who enrolled in credit-bearing programs after FastForward enrollment (categories two and four combined), only around 20.7 percent eventually (after leaving FastForward) received any credential from a credit-bearing program (including BA, AA, Diploma, or Certificate) by summer 2022. These patterns suggest that the use of noncredit CTE as a springboard to training in credit-bearing programs is very limited.

Interestingly, approximately 37 percent of the FastForward students previously enrolled in a credit-bearing program (categories three and four combined). Among these students, roughly 20 percent ever received a postsecondary credential from a credit-bearing program prior to their first FastForward enrollment spell, suggesting that one function of the FastForward program has been to provide workforce skill building opportunities for students already with postsecondary experiences and training (but as we show above, typically lacking a postsecondary credential). These patterns are fairly consistent within each main racial subgroup.

Table 8. FastForward VCCS academic outcomes: Enrollment in credit-bearing sector (2016-2017 & 2017-2018 cohort)

	Overall	White	Black	Hispanic	Asian	Other
1. Noncredit students with no credit enrollments	60.7%	51.6%	51.9%	42.8%	48.4%	82.8%
2. Noncredit students matriculating to credit	2.7%	3.1%	2.9%	2.8%	6.8%	2.0%
3. Noncredit students who were previously credit students (noncredit sector is last	25.9%	32.8%	33.0%	30.5%	26.4%	10.5%

enrollment spell)						
4. Noncredit students who were previously credit students, and also subsequently in credit sector (credit sector is last enrollment spell)	10.6%	12.5%	12.1%	23.9%	18.4%	4.7%
Total	12,534	5,403	3,291	535	337	1,290

Note. The analysis is based on only the 2016-2017 and 2017-2018 cohorts of students to enable a longer tracking window. Each column provides the percentages across the four categories for each racial subgroup. "Other" race category includes Native American, Hawaiian, Multi-ethnic, and unspecified. .

V. Discussion and Conclusion

Taken together, the results presented above yield a number of interesting findings. First, consistent with evidence from the existing literature about noncredit programs, students enrolled in FastForward programs tend to be older in age than typical students enrolled in credit-bearing programs. In addition, FastForward programs also serve a larger proportion of male students and Black students than similar CTE programs in the credit-bearing sector in Virginia, in which both males and Black students tend to be underrepresented. Whether this indicates that noncredit programs provide a potential pathway to support more equitable labor market outcomes across gender and racial groups will depend on what we learn from our upcoming investigation of labor market outcomes among FastForward program participants.

Second, compared to course completion rates reported in existing studies on noncredit vocational training that are typically around 75 percent (e.g., Xu & Ran, 2020), the average completion rate for FastForward programs at VCCS is substantially higher (93.7 percent). One plausible explanation for this high completion rate involves the dual financial incentives embedded in the WCG funding model for both students and the training institutions to complete the program. The pay-for-performance model includes requirements for students to complete the training in order to avoid paying additional costs. In addition, the cost the state pays to the training institution is also contingent on students' successful completion of the training program, thus incentivizing both individuals and institutions to achieve higher program completion.

Third, compared to the universally high program completion rate, the average credential attainment rate is noticeably lower and shows more pronounced variation across programs and student subgroups. There are also stronger gender and racial gaps in credential attainment rates, where female and Black students tend to have lower rates than their male and White counterparts. Subsequent analyses of specific programs show fairly consistent patterns within most programs, although the size of the gaps vary across programs. In addition, the overall gender and racial gaps seem to be also partly driven by students' differential sorting into programs with higher or lower average credential attainment rates. Both differential sorting across programs and within-program credential attainment gaps, sorted by gender and race, could be potential future areas for intervention, with the goal of reducing equity gaps in noncredit program success.

The pronounced between-program variations in credential attainment rates are worth additional policy attention as well. Current data does not provide a clear answer as to why credential attainment rate (and equity gaps in credential attainment) are higher for some programs than for others. This variation could be due to the design and requirements of specific noncredit programs. It may also be highly influenced by the academic and institutional support that each department/institution provides to noncredit students, all of which warrant future exploration that link specific program features and institutional supports with credential attainment outcomes, as well as with equity gaps in these outcomes.

One important issue with noncredit education, borne out by policy discussions as well as indicated in the existing literature, is the lack of state financial support to either the training institution or students enrolled in noncredit short-duration programs, thus creating financial constraints to both training participants and institutions (e.g., D'Amico et al., 2017). As policymakers across the country consider how funding mechanisms may influence the quality of short-term noncredit programs, as well as student enrollment and outcomes of these programs, the performance-based funding formula Virginia used in funding noncredit workforce training seems to be very effective in yielding both a high program completion and credential attainment rates.

Finally, our preliminary findings indicate that only a small proportion of students used the FastForward program as a bridge to enrollment in credit-bearing programs while the vast majority of students (61 percent) left college after taking only one FastForward program. This could be due to the goal of these programs, which were intended for skill upgrade within a short duration of time and for preparing individuals for jobs in the local labor market. This highlights the importance of examining the extent to which FastForward training benefits students in the labor market, which we will examine in our subsequent analyses by merging the college administrative data with students' longitudinal earnings records. It could also be the case, however, that noncredit participants lack sufficient information about stackable pathways to continue their training in the credit-bearing sector. Accordingly, providing noncredit program completers with additional information about and support to explore stackable pathways could be another potential future area for intervention.

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