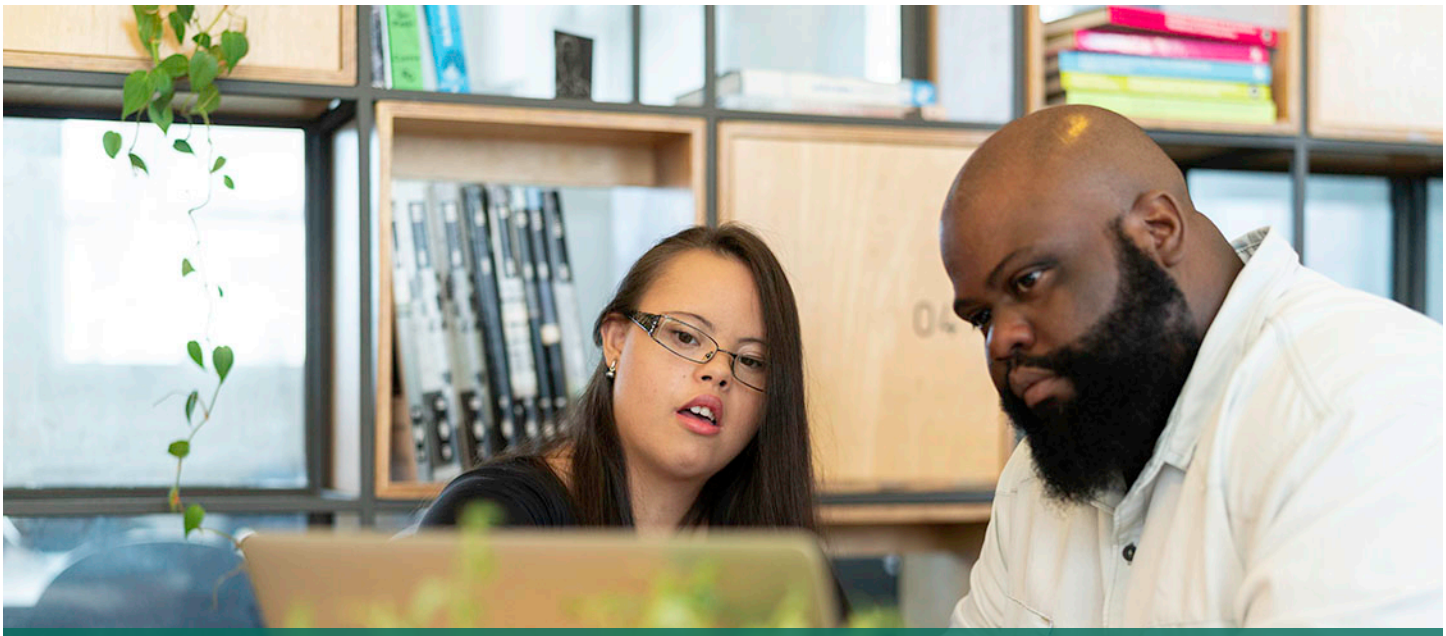

Linking Learning to Careers Demonstration

Impacts 24 Months After Enrollment

August 19, 2021

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Acronyms

AT	assistive technology
CCV	Community College of Vermont
DVR	Vermont Division of Vocational Rehabilitation
LLC	Linking Learning to Careers
NSC	National Student Clearinghouse
RSA	Rehabilitation Services Administration
VR	vocational rehabilitation
WBLE	work-based learning experience
WIOA	Workforce Innovation and Opportunity Act

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Executive Summary

The Linking Learning to Careers (LLC) program offered high school students with disabilities an individualized and targeted approach to strategically plan for their futures. The Vermont Division of Vocational Rehabilitation (DVR) designed LLC to build on its usual services for high school students to emphasize unpaid and paid work-based learning experiences (WBLEs) in integrated environments, college exploration and coursework opportunities at the Community College of Vermont, team-based guidance and support from DVR staff, dedicated support for assistive technology, and additional transportation funding.

DVR was one of five state vocational rehabilitation agencies to receive a five-year grant in 2016 from the U.S. Department of Education's Rehabilitation Services Administration to implement and evaluate demonstration projects that offer WBLEs for students with disabilities. To support a rigorous evaluation, DVR relied on a randomized controlled trial design. From April 2017 to December 2018, LLC staff recruited 803 participants to participate, assigning 413 participants to a treatment group with access to enhanced LLC services and 390 participants to a control group that could access usual transition services. DVR continued the program through summer 2021. The COVID-19 pandemic could have affected use of LLC services and participant outcomes, particularly for those participants that enrolled in LLC in 2018. This report presents evidence on LLC's impacts up to two years after students enrolled in the program.

Findings

We estimated the impact of LLC in three domains (services, education, and employment) that represent the main consideration of the program's outcomes, along with supplementary outcomes that further support the primary impact findings and could be of interest to policymakers and practitioners.

Services. LLC had a large impact on service use in the two years after youth enrolled, particularly services that LLC intended to offer. These services included those related to WBLEs, assistive technology, postsecondary education, and certain preemployment transition services. One-quarter of LLC participants (25 percent) had at least two WBLEs, including one paid (a 16 percentage point higher share than that of control group members) and more than two-thirds (68 percent) had at least one WBLE (a 41 percentage point higher share than that of control group members).

Education. LLC had a large positive impact on enrollment in postsecondary education. The program increased participation in postsecondary education by 8 percentage points: 31 percent of LLC participants had ever enrolled in postsecondary education programs compared with 22 percent of control group members). The impact was largely driven by increased enrollment in the Community College of Vermont, a key component of the intervention. LLC did not affect other educational outcomes, such as high school completion and career planning knowledge or activities, the rates of which were high among members of the treatment and control groups.

Employment. LLC did not affect employment for all participants within the first 24 months of program enrollment. Similar percentages of treatment and control group members (66 percent and 61 percent, respectively) had earnings within 24 months of program enrollment. The program did, however, increase the likelihood of earnings among later enrollees by 11 percentage points: 66 percent of LLC participants who enrolled in the second half of the program had earnings within 24 months of program enrollment compared with 55 percent of control group members who did so.

Conclusions

Although the demonstration's impacts on services and education are consistent with the LLC model and findings from the implementation evaluation, the lack of impacts on employment is inconsistent with the program's expectations. Offering high school students WBLEs, along with individualized supports to promote their success with those experiences, should have led to positive employment outcomes. Five reasons could explain the lack of impacts:

- **Many youth entered the program with work experience.** Youth already working in competitive integrated employment might not benefit from the additional employment supports LLC offered, particularly unpaid WBLEs, as much as youth might without work experience. Focusing on a youth population with specific needs and limitations regarding employment might have resulted in employment impacts for the program.
- **Most youth had not graduated high school by 24 months after enrollment.** Because LLC enrolled students in their sophomore and junior years of high school, many had not graduated high school by 24 months after enrollment, and some of those who had were enrolled in postsecondary education. Assessing employment impacts at this point in their transition to young adulthood might be too early; the program could generate impacts in these areas in the years after youth leave high school and college, particularly if LLC promotes career awareness and options through the services it offered.
- **The COVID-19 pandemic might have affected employment opportunities.** Although the pandemic constricted the economy, particularly in sectors in which youth might be more likely to find jobs, we found little evidence from analyses of quarterly earnings records that this factor affected the employment of youth in the treatment and control groups.
- **Variation in program implementation across district offices could have diluted impacts.** In the implementation evaluation report (Martin et al. 2021) and this report, we document variation in program implementation across district offices. Inconsistent implementation of one or more aspects of the LLC model could have diluted the program's impacts.
- **Either the counterfactual for LLC is particularly strong or the LLC intervention is not sufficiently different from usual services.** DVR's demonstration offered an opportunity to test the LLC model against usual DVR services with a select group of youth, and the estimated impacts should be interpreted within that context. The comparison group is not a broad group of youth with disabilities without access to transition services. Rather, the comparison group includes a large proportion of youth who already had some type of connection to DVR. The LLC intervention might not have been sufficiently different from what youth typically accessed through DVR. Impacts might have been larger among participants without strong connections to services before enrolling in LLC.

With LLC and the other four demonstrations it funded, the Rehabilitation Services Administration established a foundation to learn more about WBLE models and how they can promote outcomes for transition-age youth. The Rehabilitation Services Administration might consider the positive service and education impacts as promising indicators of the LLC model, particularly if future analyses find long-term impacts on educational attainment and employment. Because of the relatively young age of high school students, the Rehabilitation Services Administration and the broader transition community might benefit from a fuller understanding of how exposure to WBLEs and other services affect youth's career trajectories into young adulthood and beyond the limited period used for this and the other demonstration evaluations. DVR is well positioned to track service, education, and employment impacts beyond the 24-

month period used for this evaluation, which can bolster what DVR and the field learn from the LLC demonstration.

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I. Introduction and background: The Linking Learning to Careers program and demonstration

The transition from childhood to adulthood is a critical juncture, particularly for those with disabilities (Federal Partners in Transition 2020). During this period, youth develop and acquire the knowledge, awareness, and skills necessary to prepare for adulthood, independent living, or pursuit of postsecondary education. Compared with their nondisabled peers, a greater share of youth with disabilities come from economically disadvantaged backgrounds, have worse health and poorer academic performance, and (along with their parents) have lower expectations for education and employment (Lipscomb et al. 2017). These difficulties lead to lower rates of educational attainment and adult earnings (Newman et al. 2011). Youth with disabilities are more likely to be involved in the juvenile justice system and use federally funded Social Security disability programs, which they continue to rely on into adulthood (Newman et al. 2011; Stapleton and Martin 2017). Entering adulthood reliant on public benefits can discourage rather than support employment because program participants must restrict their earnings to remain eligible for benefits.

Despite the availability of transition supports, many transition-age youth with disabilities and their families encounter challenges negotiating complex systems of care as they move from youth-based to adult services. For example, most disability services provided to youth during secondary school, such as individualized education plans and section 504 Plans, are *entitlement-based* programs, which provide a coordinated set of services using a holistic wraparound approach focused on helping students thrive academically and functionally. Conversely, adult disability service systems are more fragmented, decentralized, and typically *eligibility based*, requiring youth and their families to apply or reapply for services or to visit multiple service providers for needed supports (Wittenburg and Maag 2002; U.S. Government Accountability Office 2012).

The Vermont Division of Vocational Rehabilitation (DVR) designed the Linking Learning to Careers (LLC) program with the aim of providing a more individualized and targeted approach to helping students gain confidence and strategically plan for their futures. The Rehabilitation Service Administration (RSA) funded DVR to implement and evaluate LLC as one of five RSA-sponsored demonstration projects that study early work experiences for students with disabilities. This report presents evidence on the impacts of LLC up to two years after students enrolled in the program.

A. VR agencies are critical sources of transition services

State vocational rehabilitation (VR) agencies, together with secondary schools, can play an important role in the transition of youth with disabilities. The VR program is the largest publicly funded program offering services to people with disabilities interested in preparing for and engaging in competitive employment. VR services can include rehabilitation counseling, assistive technology (AT), job accommodations, job search and placement assistance, education and training, and other services and support necessary to achieve an employment goal.

Recently, the roles of VR agencies in serving youth and students with disabilities have changed in response to the Workforce Innovation and Opportunity Act (WIOA; Pub. Law. 113-128, 128 Stat. 1425. July 22, 2014), which was enacted in 2014. Recognizing challenges faced by this population, policymakers passed WIOA to consolidate and strengthen job training programs and increase the role of VR in transition. Before WIOA, federal regulations limited VR agencies to serving students eligible for

VR services. After WIOA, VR agencies must allocate at least 15 percent of their federal matching grant funds to provide preemployment transition services to students with disabilities (RSA 2020). More specifically, WIOA allows agencies to offer these services to students who have not yet applied but are potentially eligible for VR services. Preemployment transition services include work-based learning experiences (WBLEs) and four other required services: job exploration counseling, transition or postsecondary education counseling, workplace readiness training, and self-advocacy instruction.

Of the preemployment transition services available under WIOA, WBLEs might be particularly beneficial for youth with disabilities. Evidence suggests that paid work experiences during high school effectively increase adult employment (Carter et al. 2012), and initiatives for youth with disabilities that focus on education, training, and WBLEs are associated with positive outcomes (Fraker 2014; Mazzotti et al. 2021). Even an unsuccessful or short-term job can provide a valuable learning experience for youth with disabilities (Gerhardt 2006/2007; Cadigan et al. 2006/2007). Work-based programs for youth with disabilities also increase the likelihood that youth will acquire higher quality employment outcomes, such as jobs with fringe benefits (Shandra and Hogan 2008).

Recognizing the potential benefits of WBLEs, RSA funded five demonstration projects to highlight early work experiences for students with disabilities. Vermont's DVR designed its LLC program, one of the selected demonstrations, to offer holistic, coordinated transition services and multiple individualized WBLEs during high school to improve educational and employment outcomes for students with disabilities.

B. Overview of the LLC program

LLC built on DVR's usual services for high school students to emphasize unpaid and paid WBLEs in integrated environments. LLC also provided college exploration and coursework opportunities at the Community College of Vermont (CCV), team-based guidance and support from VR staff, dedicated AT support, and additional transportation funding to support participation (Table I.1). Using a random assignment evaluation design, LLC offered specific services to 413 participants as part of a treatment group, and 390 participants in the control group accessed usual transition services, including those from DVR. To facilitate WBLE opportunities and service delivery, DVR funded transition counselors, career consultants, and youth employment specialists, some of which only worked LLC caseloads, in each of its 12 district offices. LLC participants could use other preemployment transition services, along with services as VR clients.[1] More information about the program is available in the LLC implementation evaluation report (Martin et al. 2021). DVR continued the program through summer 2021.

[1] All participants could access preemployment transition services, but only participants with an open DVR case were eligible for other DVR services.

Table I.1. Services available for treatment and control group members

Treatment	Control
WBLEs	
The LLC goal was to provide each treatment group member with three WBLEs during their involvement in the program, including one job shadow experience, one unpaid internship or volunteer experience, and one employer-paid WBLE. Youth could also obtain competitive integrated employment. LLC staff used assessment tools, such as the O*NET Interest Profiler, to align youth's interests with job opportunities.	Control group members were eligible to pursue WBLEs as part of preemployment transition services and could use online assessment tools such as O*NET, but completion of three WBLEs was not a goal.
Preemployment transition services	
Preemployment transition services were available for treatment and control group members, but preemployment transition services for treatment group members were embedded within the LLC framework and provided by the LLC team.	All students with disabilities, including those with an IEP, section 504 plan, or documented disability, were eligible for preemployment transition services. Such services help students with disabilities advocate for themselves, gain employment experience, and prepare for life after high school.
VR services	
Services for VR clients were the same for treatment and control group members.	Students determined to be eligible for VR could receive a range of services as identified in their individualized plan for employment, including career and training services, transportation, AT, and financial education counseling.
Planning tools	
LLC staff used optional planning tools developed specifically for LLC, including the LLC Career Pathway Plan, to gather treatment group members' short- and long-term career goals for their transition after high school.	Staff who provided services to control group members could use other non-LLC planning tools.
AT services	
LLC staff referred treatment group members to dedicated AT specialists as needed. AT services typically began with general information sessions to better understand the areas in which youth might benefit from AT, after which the AT specialists met individually with youth to demonstrate products and help them make informed choices. The LLC program then loaned or purchased the products for the youth, and the specialists provided ongoing follow-up support to monitor the youth's progress.	VR staff could offer AT support to control group members who were within six months of high school graduation. The VR program could not, however, purchase equipment or devices for control group members, and any AT that high schools provided remained with the school, not the student, upon graduation. Control group members would need to visit one of three AT Centers in the state for services.
Postsecondary education	
In collaboration with the CCV system, LLC offered several enhanced postsecondary education services for treatment group members, including campus tours and information sessions, specialized academic programs, multiple opportunities for dual-enrollment courses, and vouchers to cover the tuition for two courses (in addition to the two courses available through the state education agency). CCV staff worked with treatment group members to better understand the linkages between their academics and career objectives.	Control group members could receive vouchers to cover the tuition for two college courses worth up to four credits each at participating institutions.

Treatment	Control
Transportation services	
LLC offered additional funds to support treatment group members' transportation needs related to education or work opportunities. Transportation funds were intended to be flexible and cover the costs of public transportation options, taxis, and a wide range of personal expenses such as gas, reimbursed mileage, vehicle maintenance or purchase, and driver's permit or license fees.	Control group members with a VR case could obtain support for transportation services. Financial support could be requested from the case services funds or VR staff could coordinate with schools to provide transportation.

AT = assistive technology; CCV = Community College of Vermont; DVR = Division of Vocational Rehabilitation; IEP = individualized education plan; LLC = Linking Learning to Careers; VR = vocational rehabilitation; WBLE = work-based learning experience.

To assess the impacts of the program, LLC used an experimental design to randomly assign students to receive LLC services or usual services. LLC staff enrolled 803 high school students with disabilities across 12 district offices, with 413 students randomized to the treatment group and 390 to the control group (Table I.2.). Treatment and control group sizes were similar at each location, with differences of no more than five participants between groups.

Table I.2. District offices of LLC participants at enrollment

District office	Treatment	Control	Difference
Barre-Montpelier	36	37	-1
Bennington	38	37	1
Brattleboro	39	34	5
Burlington	49	48	0
Middlebury	17	12	5
Morrisville	34	33	2
Newport	35	34	2
Rutland	34	33	1
Springfield	29	27	2
St. Albans	34	31	3
St. Johnsbury	34	31	3
White River Junction	34	33	1

Source: DVR administrative data.

Notes: Some participants moved over the course of the demonstration. This table reflects participants' location at enrollment. The counts do not include 29 youth that participated in an early pilot of LLC as described in Martin et al (2021).

DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers.

The implementation evaluation report (Martin et al. 2021) documented that although LLC achieved its goal of enrolling 800 students, some LLC staff encountered challenges marketing LLC and encouraging students to enroll. Most LLC participants had at least one WBLE and other preemployment transition services during their first 18 months in the program, and one in five participants used LLC's postsecondary education, AT, or transportation services. Although LLC participants were satisfied with WBLEs, participating in three WBLEs during high school might have been an ambitious goal for the program. LLC service uptake varied across DVR district offices, with staff turnover hindering the

consistency of service delivery in many district offices. Services also differed by participants' characteristics: participants who were older, had previous employment experience, or enrolled earlier in the demonstration were more likely to engage in WBLEs and selected postsecondary education services than other participants.

C. Report organization

This report describes the processes and findings of the impact evaluation of LLC up to 24 months after enrollment. The next chapter describes the evaluation methods, including the data sources and descriptions of the analyses. Chapters III to VI present the estimated impacts of LLC on service use, education, employment, and expectations for the future, respectively. Chapter VII summarizes key findings across chapters and discusses implications for policy and practice.

The report also contains three appendices with supplemental information. Appendix A provides additional detail on data sources and outcome measures as well as the methods for the baseline equivalence assessments and the impact analysis. Appendix B highlights the sensitivity analyses and additional outcomes not included in the main report. Finally, Appendix C presents the unadjusted treatment and control group means for all outcomes.

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II. Evaluation methods

In this chapter, we describe the analytic framework we used to evaluate the impacts of the LLC demonstration in Vermont. We include a description of the motivating research questions, outcomes, data sources, statistical methods, and subgroups for which we estimated separate impacts. Appendix A provides additional methodological details.

A. Analytic framework

DVR and Mathematica designed the demonstration to meet the highest standards of the What Works Clearinghouse for a rigorous demonstration and evaluation. Key design elements for meeting this level of rigor are an experimental design, adequate sample size, low attrition, and comprehensive findings without spurious impact estimates (Institute of Education Sciences 2014).

The demonstration relied on individual random assignment to support the experimental design. From April 2017 to December 2018, LLC staff recruited 803 students who were already receiving DVR services to participate in the demonstration on a rolling basis.[2] Because of the recruitment process, the impact evaluation assessed the value of LLC services relative to usual DVR transition services rather than school-based or no transition services. After parents provided consent, DVR used an algorithm to randomly assign half the students to a treatment group and half to a control group.[3] All youth in the demonstration had access to the usual transition and VR services that DVR offers, if eligible as we describe in Chapter I (Table I.1), and youth in the treatment group could also use LLC services. Access to LLC services was because of chance, not choice, so any observed differences in outcomes between the treatment and control groups is likely attributable to the LLC program. Mathematica's implementation evaluation confirmed that LLC followed random assignment procedures without any contamination that could bias the interpretation of results. Both groups had similar demographic characteristics, family background, expectations, and health conditions as measured at enrollment (Table II.1), furthering our confidence in the experimental design of the impact evaluation.

Within this experimental design, we used an intent-to-treat framework to estimate LLC's impacts. With an intent-to-treat framework, the evaluation assesses impacts across all members of the treatment group regardless of their level of engagement with services. It does not provide estimates of the impact of the actual program services on the youth that used them (whether any individual service or all of them as a package). Instead, it provides inference of what impact the program would have if replicated elsewhere in real world settings, with some youth using more services than others.

B. Research questions and outcomes

We estimated impacts on a comprehensive set of outcomes across data sources to answer the following research questions:

- Were treatment group members substantially more likely than control group members to use the services intended by the program?
- Were treatment group members substantially more likely than control group members to attain paid competitive employment or enroll in postsecondary education?

[2] One student did not enroll until January 2019.
[3] In this report, we use the term parent to refer to parents and guardians.

- Compared with the control group, were treatment group members more satisfied with their career progress?

Although we present findings for all outcomes in this report, we selected a single primary outcome in each of three domains to determine whether LLC had its intended impact:

- Services: at least two WBLEs, including one paid, within 24 months of enrollment
- Education: enrolled in at least one postsecondary education course by December 2020
- Employment: had at least one quarter of earnings within the eight quarters after enrollment

Relying on a single primary outcome for a domain addresses issues with multiple comparisons. This issue occurs because the probability of detecting spurious impacts increases with the number of outcomes tested simultaneously. We selected these three outcomes to indicate LLC's effectiveness because they (1) focus on key LLC components that applied to all treatment group members and (2) can be measured in administrative data and are thus less prone to attrition or nonresponse than self-reported or proxy-reported survey data. We did not include a primary outcome related to expectations or satisfaction because the youth follow-up survey (which asked about expectations and satisfaction) had a low response rate (described in the next section). We consider all outcomes other than primary outcomes to be supplementary outcomes. We report regression-adjusted treatment and control group differences for selected supplementary outcomes in the relevant chapters of the report and for other supplementary outcomes in Appendix B.

We measure most outcomes at or for a duration of about 24 months after a participant enrolled in the demonstration. This approach enables us to observe each participant for the same duration despite demonstration enrollment occurring over 18 months. The exceptions are education outcomes of enrollment in postsecondary education, which we measure through December 2020, because of limitations in data access, as we describe in the next section.

C. Data sources

We used data from six sources for the impact analysis: (1) LLC enrollment data, (2) a baseline survey, (3) DVR administrative data, (4) Vermont unemployment insurance data, (5) the National Student Clearinghouse (NSC) data, and (6) 24-month follow-up surveys of youth and parents.

Two data sources provide information important for the impact evaluation about all participants at the time they enrolled in the demonstration. **LLC enrollment data** identify which participants LLC randomized to the treatment and control groups, respectively, their application dates, and the district office associated with their applications. The **baseline survey** collected data to assess baseline equivalence across the treatment and control groups and to adjust for background characteristics in the multivariate regression models we describe in the next section. These data include demographic and disability characteristics, employment history, expectations for the future, and information about their parents. Reflecting the rolling enrollment into the demonstration, the program collected these data from July 2017 to December 2018.

Three administrative data sources provide time series information on participants' services, education, and employment from April 2017 to December 2020. We used **DVR administrative data** from the agency's case management system to measure participants' use of services during the demonstration. These data include all 803 demonstration participants. We used **Vermont unemployment insurance**

data, which contain quarterly earnings, to measure employment and earnings. DVR obtained these data from the Vermont Department of Labor for the 715 demonstration participants who provided Social Security numbers to DVR. We estimated impacts, however, using only the subset of 638 participants who provided valid Social Security numbers at the time of random assignment. Excluding those who did not provide a valid number at random assignment avoids the bias of more treatment group members than control group members providing Social Security numbers after enrollment because of their LLC involvement. Finally, we use DVR's tabulations from the **NSC data** to measure enrollment in postsecondary education. The NSC collects student-level enrollment and credential information from 84 percent of all two- and four-year public, private nonprofit, and private for-profit colleges and universities, which includes 97 percent of all students enrolled in Title IV degree-granting institutions (Dundar and Shapiro 2016). DVR requested data matches for all 803 demonstration participants using names and dates of birth and confirmed the accuracy of the matches using corroborating information in case files. Because of data-sharing restrictions, DVR could not share the individual records from NSC with Mathematica, so it provided tabulations of these data for treatment and control group members.

The **24-month follow-up surveys of youth and parents** provide their respective perspectives on various outcomes related to transition. The youth survey asked about services used, recent employment, recent education, and expectations for future employment and earnings. The parent survey included questions about transition planning and expectations of future employment. Mathematica contacted youth and parents to complete the survey roughly 24 months after the youth enrolled in the demonstration, which resulted in a data collection period of September 21, 2019, to January 17, 2021. On average, youth and parents completed the survey approximately 25.6 months and 25.0 months after enrollment, respectively. We obtained responses from 378 youth and 374 parents, with overall response rates of 47 percent for each group. The response rates were notably higher among the treatment group youth and parents (52 percent) than among the control group youth and parents (42 percent). The low response rates, below the 80 percent target, might have been partly attributable to the COVID-19 pandemic, which limited our ability to interview youth and parents in person.

D. Estimation methods

For most outcomes, we used multivariate regression models to estimate LLC's impact. These models enable us to adjust for differences in treatment and control group members' baseline characteristics. Although random assignment resulted in treatment and control groups with similar baseline characteristics (Table II.1), controlling for small differences can improve the precision of the estimates. This improved precision can sometimes be critical in assessing whether observed differences in outcomes are statistically significant when sample sizes or differences are small. For all outcomes, we show the unadjusted mean for the control group and the regression-adjusted mean for the treatment group. The control group means provide a counterfactual for what the outcomes among treatment group members would have been had they not participated in LLC. We report the impact as the difference between the unadjusted control group mean and the regression-adjusted treatment group mean, identifying whether this impact is statistically significant at three standard *p*-value thresholds: the 10, 5, and 1 percent levels.

An exception to this approach is for the estimates of impacts on postsecondary enrollment outcomes measured in the NSC. Because DVR could not share the NSC data with Mathematica, DVR estimated the impacts by comparing the unadjusted differences of the treatment and control groups. We tested the difference in proportions between the treatment and control groups using the critical value of the normally distributed z statistic to assess whether observed differences were statistically significant.

Table II.1. Characteristics of treatment and control group members at enrollment

Variable	Treatment mean	Control mean	Difference (T – C)
Number of participants	413	390	
Demographics			
Gender (percentage)			
Male	61.5	59.5	2.0
Not male	38.5	40.5	-2.0
Average age (years)	16.7	16.8	0.0
Race (percentage)			
Black	4.6	5.6	-1.0
White	93.0	93.6	-0.6
Other	10.7	9.0	1.7
Hispanic ethnicity (percentage)	5.3	6.4	-1.1
Grade level (percentage)			
9th or 10th	45.8	46.7	-0.9
11th, 12th, missing, and other	54.2	53.3	0.9
Parent or guardian characteristics			
Education: at least one parent has a college degree (percentage)	37.0	35.6	1.4
Relationship status of responding parent or guardian (percentage)			
Single	9.4	11.5	-2.1
Married or cohabiting	61.5	62.1	-0.6
Separated, divorced, or widowed	25.4	22.6	2.9
Any earned income in the past year (percentage)	81.4	82.1	-0.7
Impairment or condition and health			
Percentage ever identified as having			
ADD or ADHD	45.5	48.2	-2.7
Autism spectrum disorder	16.2	16.4	-0.2
Emotional or behavioral disorder or emotional disturbance	34.6	39.5	-4.9
Intellectual disability	11.1	10.3	0.9
Learning disability	49.4	49.7	-0.3
Speech, hearing or visual impairment	27.4	30.5	-3.2
Physical impairment or other	15.3	18.7	-3.5
When disability or condition was first identified (percentage)			
Birth	7.3	6.2	1.1
Before kindergarten	25.4	27.4	-2.0
Kindergarten to 2nd grade	30.5	28.7	1.8
3rd to 5th grade	20.6	19.7	0.8

Variable	Treatment mean	Control mean	Difference (T – C)
6th to 8th grade	7.5	9.7	-2.2
9th to 12th grade	4.8	3.6	1.3
Participant's self-reported health (percentage)			
Excellent or very good	57.4	56.4	1.0
Good	32.9	33.3	-0.4
Fair or poor	9.4	10.0	-0.6
Service receipt			
Has an open VR case (percentage)	22.5	24.9	-2.4
Receives special education services or has an individualized education program (percentage)	80.1	83.1	-2.9
Has a section 504 plan (percentage)	15.3	13.8	1.4
Receives free or reduced-price school lunch in past 12 months (percentage)	51.8	52.6	-0.7
Receives Supplemental Security Income or Social Security Disability Insurance benefits because of a disability (percentage)	17.9	18.7	-0.8
Employment			
Worked at a job or business with pay any time in the past year (percentage)	53.3	52.8	0.5
Worked at a job or business without pay any time in the past year (percentage)	8.7	6.9	1.8
Currently working (percentage)	33.7	33.1	0.6
Hours per week worked at most recent job in the past year (percentage)			
Less than 10 hours per week	31.5	28.7	2.8
10 to 20 hours per week	18.9	17.7	1.2
21 to 30 hours per week	4.8	5.4	-0.5
More than 30 hours per week	5.1	5.9	-0.8
Worked at a school-sponsored work-based learning activity in the past year (percentage)	13.6	10.3	3.3
Expectations			
Expects to attend postsecondary education (percentage)	67.8	65.4	2.4
Expects to be living outside of parent or guardian's home (percentage)	90.1	89.0	1.1
Definitely or probably expects to be working at a paid job at age 30 (percentage)	98.1	98.5	-0.4

Source: DVR administrative data and LLC baseline survey.

Note: None of the differences between the treatment and control groups are statistically significant.

ADD = attention deficit disorder; ADHD = attention-deficit/hyperactivity disorder; DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; VR = vocational rehabilitation.

E. Subgroup analyses, impacts across district offices, and sensitivity analyses

Because some youth might have benefited from LLC more than others, we examined outcomes for selected subgroups and across district offices. Although the small number of participants in some of these subgroups and each district limits the likelihood of detecting statistically significant differences across subgroups, notable differences could still be informative. We selected subgroups that might be relevant to the program or policies, might have been affected by gaps in the existing system, and might have been more or less engaged with LLC services. We estimated whether the demonstration had a differential impact by gender, impairment (has attention-deficit/hyperactivity disorder versus does not have it), grade level at enrollment, and income-based eligibility for free or reduced-price school lunch (Tables B.1 and B.2). In addition, because a number of factors that could affect impacts varied across DVR districts, such as school districts, economic environments, and staff implementation, we separately estimated impacts on primary outcomes across district offices (Table B.3).

We conducted sensitivity analyses to assess the robustness of our estimates (Table B.4). To determine whether the subset of participants that completed the 24-month youth survey experienced impacts different from those who did not complete the survey, we report primary service and employment outcomes on these two subsets of youth. To assess whether the timing of participant enrollment affected the impacts of the demonstration, we compared the impacts on the primary service, education, and employment outcomes of youth who enrolled earlier (July 2017 to June 2018) in the demonstration with those of youth who enrolled later (July 2018 to December 2018). Youth who enrolled later might have benefitted from greater staff experience with LLC, but they might have been more directly affected by the COVID-19 pandemic and associated economic conditions than earlier enrollees were. Youth who enrolled earlier completed most or all of the 24-month study observation period before the pandemic began in March 2020.

Finally, we report unadjusted means for primary outcomes in Appendix C. These show whether the main impact estimates are sensitive to the regression adjustments.

III. LLC's impacts on service outcomes

Services are the means by which LLC expects to influence adult employment outcomes. Understanding the services participants actually used provides context for findings in the other domains. Because of LLC's emphasis on individualized planning, needs assessment, and skill development, we expected to find that a higher share of treatment group members had WBLEs and other DVR-related services for AT, postsecondary education, and transportation.

In this chapter, we present findings for primary and supplementary outcomes for the service domain. These outcomes include pre-employment transition services and other VR services from administrative data that were not the focus of the demonstration. We also present selected participant reports of services and perspectives from the survey data. Table B.5 presents additional service outcomes.

As intended, LLC had a large, positive impact on the primary outcome and many supplementary outcomes related to DVR service engagement. Just one quarter of treatment group members, however, met the primary goal of participating in at least two WBLEs, including one paid, which suggests that reaching this goal before high school graduation might be ambitious for sophomores and juniors. Alternatively, it could also reflect the fact that more than half of all participants already had worked for pay at enrollment (Table II.1); as a result, some might not have seen the value of participating in DVR-specific WBLEs such as job shadows. An important caveat is that we can assess only services and WBLEs that DVR staff recorded in their administrative data; treatment and control group members could have had work experiences that DVR staff did not document. Our estimates of LLC's service impact might therefore be biased upward if DVR staff kept treatment cases open for longer and control group members had work experiences that DVR staff did not document. Findings from survey data reveal that most control group members also used a number of services outside of those documented by DVR. Treatment group members reported service use—particularly the services that LLC emphasized (such as education and AT)—at higher rates and had lower reports of having unmet needs than control group members did.

A. Primary outcome: At least two WBLEs, including one paid

The primary outcome for the service domain is whether a participant had at least two WBLEs, including one paid, within 24 months of enrollment. This measure aligns with RSA's expectations for the demonstration but is short of DVR's goal to facilitate three WBLEs for all treatment group members during the demonstration. From DVR's administrative data, we identified WBLEs as job shadows, other unpaid WBLEs such as internships or volunteer experiences, and competitive integrated employment. LLC had a large statistically significant impact on this measure of service use. One-quarter of treatment group members (25 percent) had at least two WBLEs, including one paid (Table III.1). This rate was more than two-and-a-half times that of control group members (9 percent).

Table III.1. LLC's impacts on DVR services within 24 months of enrollment

Outcome	Treatment mean	Control mean	Impact
Primary outcome			
Had at least two WBLEs, including one paid (percentage)	24.8	9.2	15.6*** (2.6)
Supplementary outcomes			
Had at least one work experience (job shadow, WBLE, or CIE) (percentage)	68.4	27.7	40.7*** (3.2)
Had at least one job shadow (percentage)	8.9	3.3	5.6*** (1.7)
Had at least one unpaid WBLE other than job shadow (percentage)	34.6	11.5	23.1*** (2.9)
Had at least one CIE (percentage)	40.2	18.5	21.8*** (3.1)
Number of WBLEs	1.4	0.5	0.8*** (0.1)
Used any preemployment transition service other than WBLEs (percentage)	88.2	70.8	17.5*** (2.8)
Job exploration services (percentage)	81.0	62.1	18.9*** (3.1)
Counseling on postsecondary education opportunities (percentage)	60.5	36.7	23.9*** (3.4)
Workplace readiness training (percentage)	30.0	28.5	1.5 (3.2)
Self-advocacy training (percentage)	23.4	19.0	4.5 (2.9)
Has or had an open DVR case (percentage)	94.7	58.0	36.7*** (2.7)
Had a DVR case that closed with an outcome of CIE (percentage)	0.0	1.8	-1.8*** (0.7)
Used any non-LLC DVR services other than preemployment transition services (percentage)	59.5	25.4	34.1*** (3.2)

Source: DVR administrative data.

Notes: N = 413 treatment group members and 390 control group members. We regression adjusted treatment means and impacts to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Impact estimate is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

CIE = competitive integrated employment; DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; WBLE = work-based learning experience.

B. Supplementary outcomes

The findings for the supplementary outcomes in the services domain support the main finding that LLC treatment group members were more likely to receive employment-promoting services than control group members. The supplementary outcomes span five categories: other WBLE outcomes, use of preemployment transitions services, DVR case status and services (all from DVR administrative data, Table III.1), self-reported service use, and satisfaction with services and progress toward goals (from the youth follow-up survey, Table III.2).

Other WBLE outcomes. Reflecting the impact on the primary outcome of two WBLEs, LLC increased use of each type of WBLE and the average number of WBLEs. Treatment group members had significantly higher rates of engaging in at least one WBLE and each of the three types of WBLEs—job

shadows, other unpaid WBLEs, and competitive integrated employment—than control group members did. More than two-thirds (68 percent) of treatment group members had at least one WBLE, which is more than twice the rate of control group members (28 percent). Job shadows were the least frequently used WBLE for treatment and control group members, and higher shares of participants had other unpaid WBLEs or competitive integrated employment, particularly among the treatment group. In total, treatment group members had an average of 1.4 WBLEs, which was significantly higher than the control group's average of 0.5 WBLEs.

Use of preemployment transition services. WIOA requires VR agencies to offer students with disabilities four categories of preemployment transition services in addition to WBLEs. LLC increased use of those other preemployment transition services. Most treatment and control group members used at least one other preemployment transition service, and treatment group members were 18 percentage points more likely to have used any of these services. Treatment group members engaged in job exploration services and counseling on postsecondary education opportunities at significantly higher rates than did control group members (by 19 and 24 percentage points, respectively). LLC did not affect participation in workplace readiness or self-advocacy training, which had the lowest uptake rates in both experimental groups.

DVR case status and services. As intended, treatment group members applied and were found eligible for DVR services at significantly higher rates than their control group counterparts. Although 58 percent of control group members had an open DVR case at some point within 24 months of LLC enrollment, nearly all (95 percent) treatment group members attained this milestone. Few participants in either group exited VR services during this time period; 2 percent of control group members had a DVR case that closed because they attained a competitive integrated employment position compared to none of treatment group members. This pattern is consistent with LLC's intent to keep treatment group members connected with DVR throughout the demonstration as a way of establishing a bridge between youth and adult services. Finally, more than half (60 percent) treatment group members used DVR services other than preemployment transition services and LLC-specific services during the two years after enrolling in the demonstration. Just over a quarter of control group members did the same.

Self-reported services used. LLC affected youths' self-reported service use in ways that were consistent with the project's logic model. The large majority of treatment and control group members reported use of any services (99 percent versus 93 percent, respectively; Table III.2). Nonetheless, the 6 percentage-point difference between the groups is statistically significant. Treatment group members accessed 5 of the 13 services queried in the survey at significantly higher rates than their control group counterparts: information and referral services, services to help with life skills, services to help learn about or get into a school or training program, job skills training, and AT services. In addition, half or more of both treatment and control group youth reported using the following services: information and referral, life skills, activities to learn about what jobs match one's skills and interests, finding or applying for jobs, and how to save or manage money. About 7 percent of control group members reported that they did not access any needed help or services in preparing for work or school, a significantly higher share (by 6 percentage points) than for treatment group members. Despite treatment group members using AT services at a higher proportion than control group members did, the two experimental groups did not differ in the proportions using AT tools often or always.

Satisfaction with services and progress toward goals. LLC did not affect participants' overall satisfaction with services. Most enrollees (85 percent of treatment group members and 87 percent of control group members) were very or somewhat satisfied with the services they used to advance in school

or prepare for a job after school, and roughly three-quarters of both groups indicated that they were very or somewhat successful in reaching their goals. Treatment group members, however, were significantly more likely to report being satisfied with the AT tools they used (Table B.5).

Table III.2. Participant reports of service use and satisfaction

Outcome	Treatment mean	Control mean	Difference
Number of survey respondents	214	164	
Reported using any services in the past year (percentage)	98.7	92.9	5.7** (2.9)
Service type (percentage)			
Information and referral	76.1	66.1	10.0* (5.2)
Life skills	68.9	59.8	9.1* (5.5)
Finding or applying for a job	62.1	56.7	5.4 (5.6)
Activities to learn about what jobs match skills and interests	60.6	54.0	6.6 (5.6)
Learning about or getting into a school or training program	59.1	42.3	16.7*** (5.5)
How to save and manage money	52.9	51.8	1.1 (5.8)
Self-advocacy training	41.4	45.0	-3.6 (5.5)
Job skills training	35.9	26.8	9.0* (5.4)
Transportation to or from a workplace activity	34.8	39.6	-4.8 (5.4)
Assistive technology	32.4	19.3	13.1*** (4.9)
Benefits counseling	20.2	19.0	1.2 (4.5)
Help while working at a job	19.1	18.2	0.9 (4.2)
Other services to help them work, go to school, or help their family in other ways	9.0	6.9	2.1 (3.4)
In the past year, had unmet needs related to preparation for work or school (percentage)	1.3	7.1	-5.7** (2.9)
Very or somewhat satisfied with the services used to help advance in school or prepare for a job after school (percentage)	84.6	87.3	-2.7 (4.1)
Very or somewhat successful in reaching goals (percentage)	76.4	74.6	1.8 (4.9)
Always or often use assistive technology tools (percentage)	26.6	21.6	5.0 (4.4)

Source: LLC youth follow-up survey.

Notes: N = 214 treatment group members and 164 control group members who responded to the survey. Sample sizes vary slightly across survey responses. We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of differences are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

LLC = Linking Learning to Careers.

C. Subgroup and district office differences

LLC might have had a greater impact on some enrollees because the services they otherwise would have accessed were less robust, because the participants were more engaged with LLC, or because of variation in implementation across DVR districts or in the school and community environment. We did not find statistically significant differential impacts across the five subgroups we examined: gender, disability type, grade at enrollment, early versus later enrollment, and eligibility for free or reduced-price school lunch (Table B.1). We did find that the impact of LLC on the primary service outcome varied

substantially across district offices, with larger-than-average impacts in some district offices and no impacts in other district offices (Table B.3).

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IV. LLC's impacts on education outcomes

The LLC program expected that enhanced services offered to the LLC treatment group would positively impact their education outcomes. These outcomes included higher rates of participation in postsecondary education and training opportunities as well as greater clarity on how to attain a job compared with the control group. In the longer term, a positive impact of LLC on education outcomes could also lead to better employment outcomes.

We present findings on primary and supplementary outcomes in the education domain. The primary outcome in this domain is enrollment in postsecondary education at CCV and other postsecondary institutions as measured in NSC administrative data. We also present selected participant reports of education and their perspectives on career planning from the youth follow-up survey. Table B.6 presents additional education outcomes.

LLC led to a large and statistically significant increase in postsecondary education enrollment. LLC was not associated with differences in other educational outcomes, such as high school completion and career planning knowledge or activities, the rates of which were relatively high among members of the treatment and control groups. Thus, there is no evidence that these outcomes drove the impact on postsecondary education enrollment. LLC's impact on the use of education services, however, might have contributed to the positive impact (shown in Chapter III). Substantially more treatment group members than control group members obtained counseling on postsecondary education opportunities (Table III.1) and reported using services to learn about school and training opportunities (Table III.2). These outcomes on postsecondary education services and enrollment reflect LLC's focus on postsecondary education as described in the implementation report (Martin et al. 2021).

A. Primary outcome: Ever enrolled in postsecondary education

The primary outcome for the education domain is whether a participant ever enrolled in postsecondary education. From NSC administrative data, we measured this outcome by identifying enrollment at technical training schools, two-year community colleges, and four-year colleges through December 2020. LLC increased enrollment in postsecondary education. More than 30 percent of treatment group members attended postsecondary education institutions, a rate that is 8 percentage points higher than that of control group members (22 percent) (Table IV.1).

LLC encouraged treatment group members to engage in postsecondary education services such as campus tours and information services, dual enrollment courses, and specialized contract courses (Martin et al. 2021). LLC offered most of these services through a partnership with CCV that connected treatment group members to postsecondary education opportunities. Our understanding is that enrollment in these introductory courses would not be documented in the NSC data, so the observed impacts on postsecondary education in the NSC data likely do not include courses that were part of the LLC program. Nonetheless, the NSC data might include some courses that youth took as part of the LLC program. Although we cannot attribute any single component of LLC to the increase in postsecondary education enrollment, LLC's partnership with CCV might have been instrumental in generating this impact enrollment.

B. Supplementary outcomes

The supplementary outcomes we assess in the education domain span two categories: specific types of school enrollment (from the NSC data, Table IV.1) and academic and career planning (from the youth follow-up survey, Table IV.2).

Table IV.1. LLC impacts on postsecondary education through December 2020.

Outcome	Treatment mean	Control mean	Impact
Primary outcome			
Ever enrolled in postsecondary education (percentage)	30.6	22.4	8.2*** (3.1)
Supplementary outcomes			
Enrolled in courses at CCV (percentage)	22.3	14.7	7.6*** (2.7)
Enrolled at other postsecondary education institutions (percentage)	13.6	11.3	2.3 (2.3)

Source: National Student Clearinghouse data.

Notes: N = 413 treatment group members and 390 control group members. Standard errors of the impact estimates are in parentheses.

*/**/*** Impact estimate is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

CCV = Community College of Vermont

Other school enrollment outcomes. LLC increased enrollment in CCV by about 8 percentage points, but it had no impact on other types of school enrollment. About 22 percent of treatment group members and 15 percent of control group members enrolled in at least one course at CCV through December 2020 (Table IV.1). With nearly 100 percent of treatment and control group members successfully completing or continuing with secondary school, we find no evidence that the LLC program had an impact on completion or continued enrollment in high school (Table IV.2). Although the share of participants enrolled in postsecondary education in each group at the time of the survey interview was not significantly different, the size of the estimate based on the follow-up survey is consistent with the size of the NSC data estimate. At the time of the survey, 31 percent of the treatment group and 23 percent of the control group reporting being enrolled in postsecondary education (Table IV.2).

Academic and career planning. The LLC program did not have an impact on academic and career planning or knowledge. Most LLC participants agreed or strongly agreed with each of the five academic and career planning statements, reflecting that they had the necessary tools to plan for a future career of their choice (Table IV.2). About three-quarters of participants agreed or strongly agreed with three measures of career planning knowledge (knowing where to get more information about jobs, what jobs were a good fit for them, and the requisite skill for these jobs). Slightly fewer reported having engaged in each of two specific career planning activities (taking steps to learn about different jobs and having a plan outlining the steps they have to take to get the job they want). The responses did not vary significantly across the experimental groups.

Table IV.2. Student reports and perspectives on education outcomes, 24 months after enrollment

Outcome	Treatment mean	Control mean	Difference
Completed or currently enrolled in secondary school (percentage)	97.9	98.8	-0.8 (1.1)
Enrolled in postsecondary education at the time of the survey (percentage)	30.7	23.4	7.3 (5.1)
Agree or strongly agree (percentage):			
I know what types of jobs are best for me	83.8	84.5	-0.8 (4.0)
I know what skills and training I need for the job(s) I want	76.8	78.7	-2.0 (4.7)
I know where to go online to learn about different types of jobs and careers as well as the education and training needed for them	75.0	80.0	-5.0 (5.0)
I have taken steps, such as visited businesses or taken career surveys, to learn about different kinds of jobs	70.7	65.2	5.5 (5.2)
I have a plan outlining the steps that need to be taken to obtain the job(s) I want	65.9	69.1	-3.2 (5.6)

Source: LLC youth follow-up survey.

Notes: N = 214 treatment group members and 164 control group members that responded to the survey. Samples sizes vary slightly across survey responses. We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of differences are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

LLC = Linking Learning to Careers.

C. Subgroup differences

The estimated impact of LLC on postsecondary education enrollment was positive and significant among LLC participants who enrolled in the demonstration earlier (July 2017 to June 2018) but not for those who enrolled later (July 2018 to December 2018) (Table B.4). This pattern is not surprising because earlier enrollees were older, and we observed their educational outcomes over a longer duration (an additional year). The COVID-19 pandemic might also have disproportionately dampened or delayed postsecondary education enrollment among participants who enrolled later. Because of data limitations, we could not analyze other subgroup differences for the primary outcome of the education domain.

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V. LLC's impacts on employment outcomes

The driving motivation for the LLC program was to improve employment outcomes for youth and young adults with disabilities. Youth employment is a strong predictor of adult employment, so it could be considered an indicator of whether transition-age youth will go on to have a career later in their lives. As we describe in Chapter III, one LLC goal was for treatment group members to have at least one paid work experience during the demonstration.

In this chapter, we describe LLC's impact on primary and supplementary employment outcomes. We used Vermont unemployment insurance data from the Vermont Department of Labor to measure employment and earnings in the eight calendar quarters after the quarter in which each participant enrolled in the demonstration. We used data from the youth follow-up survey for participants' perspectives on their employment. Table B.7 presents additional employment outcomes.

LLC did not have a significant impact on any of the primary or supplementary employment outcomes, though it did have a positive impact on employment for one of the examined subgroups. Most participants had at least one quarter of earnings within the eight quarters after enrollment. This finding supports observations at baseline, in which more than half of participants reported working in the previous year and one-third had jobs at the time of their enrollment in the demonstration. Although the COVID-19 pandemic could have affected the LLC program's impact on employment, we have no evidence that it did so in ways that differed across the experimental groups. Both treatment and control group members had lower rates of documented earnings in the second quarter of 2020, but those rates rebounded the following quarter (Table B.7). For those who enrolled in the demonstration in the later part of the enrollment period (from April 2018 to December 2018), the estimated impact on the primary employment outcome was 16 percentage points higher than for those who enrolled in the first part of the program. Long-term employment impacts of LLC could be measured in the future as participants embark on careers, especially given the impact of LLC on postsecondary education enrollment (Chapter IV).

A. Primary outcome: Had at least one quarter of earnings

The LLC program did not have an impact on earnings. The primary outcome for the employment domain is whether a participant had at least one quarter of earnings within the eight quarters after the quarter in which they enrolled in the demonstration. Nearly two-thirds of all LLC participants had such earnings in this period regardless of experimental group (Table V.1).

Table V.1. Impacts of LLC on employment outcomes during eight quarters after enrollment quarter

Outcome	Treatment mean	Control mean	Impact
Number of participants who provided Social Security numbers	339	299	
Primary outcome			
Had at least one quarter of earnings (percentage)	65.6	61.0	4.7 (3.8)
Supplementary outcomes			
Any earnings (percentage)			
First four quarters after enrollment	49.0	46.5	2.6 (4.0)
Second four quarters after enrollment	59.5	56.9	2.6 (3.9)
Average weekly earnings ($2021)	60.2	65.1	-5.0 (6.9)
First four quarters after enrollment	40.6	46.0	-5.4 (5.7)
Second four quarters after enrollment	79.7	84.2	-4.5 (9.3)

Source: DVR administrative data and Vermont unemployment insurance data.

Notes: N = 339 treatment group members and 299 control group members that provided Social Security numbers at enrollment. We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers.

B. Supplementary outcomes

Our analyses across three categories of supplementary outcomes related to employment (employment and earnings, engagement, and job satisfaction) provide further evidence for LLC's lack of an impact on employment.

Employment and earnings. LLC did not have an impact on any of the supplementary outcomes related to employment and earnings as measured in administrative or survey data. From the administrative data, we measured the likelihood of having any earnings separately over the first four and second four quarters as well as average weekly earnings in aggregate and separately for the first four and second four quarters after the quarter of enrollment (Table V.1). Despite the lack of impacts, earnings rates and average weekly earnings increased during the second four quarter period from the first four quarter period across both experimental groups. A larger share of participants reported being employed in the survey than we observed with earnings in the administrative data (Table V.2). About 80 percent of participants reported being employed during the year before the follow-up survey compared with the roughly 60 percent rate we observed over roughly the same period in the administrative data. This difference likely reflects paid and unpaid work experiences reported in the survey by participants. Similar proportions of treatment and control group youth (about half) reported working at the time of the survey.

Productive engagement. Because of the age of participants, many might enroll in postsecondary education, as we describe in Chapter IV, so they might not launch their careers until after college completion. As a result, a measure that combines employment and college enrollment can be a useful measure of engagement in productive pursuits. Treatment and control group participants were equally likely to be engaged in productive pursuits at the time of the survey; nearly two-thirds of both groups

reported working or being enrolled in postsecondary education 24 months after program enrollment (Table V.2).

Job satisfaction. LLC had no impact on participants' satisfaction with their most recent job. Nearly all participants who had worked in the year before the follow-up survey reported that they were somewhat or very satisfied at their most recent job (Table V.2). This finding suggests that treatment and control group members were able to find and obtain jobs that they enjoyed.

Table V.2. Participant reports and perspectives on employment (percentage)

Outcome	Treatment mean	Control mean	Difference
Employed in last year (percentage)	79.2	83.8	-4.6 (4.0)
Employed at the time of the survey (percentage)	50.0	53.2	-3.2 (5.7)
Working or enrolled in postsecondary education at the time of survey (percentage)	63.5	65.4	-1.9 (5.3)
Somewhat or very satisfied at most recent job (among those with a job) (percentage)	90.6	85.4	5.3 (4.3)

Source: LLC youth follow-up survey.

Notes: N = 214 treatment group members and 164 control group members that responded to the survey. Samples sizes vary slightly across survey responses. We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors appear in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

C. Subgroup and district office differences

Although LLC did not have a significant impact on employment in aggregate, it did have a significant positive impact on employment for one subgroup of participants. Two-thirds (66 percent) of treatment group members who enrolled later in the demonstration had at least one quarter of earnings, a rate that was 11 percentage points higher than that of control group members (55 percent). The estimated impact on employment was 16 percentage points higher among participants who enrolled in the demonstration in the later part of the enrollment period (from April 2018 to December 2018) relative to the estimated impact for those who enrolled earlier (Table B.2). We did not observe any differential impacts for the other four subgroups (disability type, gender, grade at enrollment, and eligibility for free or reduced-price school lunch).

The finding of no impacts on earlier participants and impacts on later participants could be because of three reasons: (1) the program was better implemented over time, (2) the LLC program provided an employment buffer against the pandemic recession, or (3) early and late participants differed in important ways that could affect how they benefitted from LLC. Although differences between treatment and control groups through 2020 are not large enough to draw conclusions about whether the pandemic affected LLC's impact on employment, findings from the implementation report provide some evidence for the first and third explanations (Martin et al. 2021). Early and late enrollees are similar across most baseline characteristics, though a substantially higher share of early enrollees had prior engagement with DVR before LLC enrollment (that is, they had an open VR case or had received preemployment transition services). Late enrollees included a higher share of students without such DVR engagement. This difference resulted from expanding recruitment to high schools (Chapter 1) and provides suggestive

evidence that youth not already engaged with DVR could benefit more from LLC than youth already engaged with DVR.

We also found that the treatment and control group rates of employment varied substantially across district offices, with a positive and statistically significant impact in one district office but not others (Table B.3).

VI. LLC's impacts on expectations

To build confidence about their futures, LLC offered youth opportunities to explore their interests and enhance their skills through hands-on work experiences and postsecondary education services. With a successful intervention, treatment group members would develop a better understanding of their interests and skills through these experiences, which could improve youth's planning for their futures. Moreover, though youth's participation in the intervention and engagement with enhanced services, parents might experience change in their expectations for those youth.

This chapter highlights the expectations of LLC participants and their parents 24 months after enrollment. All results in this chapter are considered supplementary outcomes because although changes in expectations help contextualize findings on other outcomes, they were not part of the program's logic model. Table B.8 presents additional expectation outcomes.

LLC increased youth's expectations for earning a college degree, but it did not have a detectable effect on other expectations of treatment group youth and parents about the future. The impact on college expectations is consistent with LLC's focus on educational opportunities. One factor that might have limited the ability of LLC to influence other expectations is that at enrollment, most youth (98 percent) reported that they expected to work at age 30, and their parents had similar expectations for them (97 percent) (Martin et al. 2021). These high expectations at enrollment and 24 months later contrast with published research on expectations of students participating in special education (Lipscomb et al. 2017). This discrepancy suggests that the youth and families who agreed to participate in LLC were especially focused or interested in employment and postsecondary education options, more so than the broader group of youth with individualized education plans or section 504 plans.

A. Supplementary outcomes: Youth and parent expectations

LLC positively affected expectations about college education but not about work or financial support. Almost all participants (95 percent) expected they would definitely or probably work for pay at age 30, regardless of experimental group, and nearly three-quarters expected to earn enough to support themselves without financial help from family or government benefit programs. Most parents (91 percent of treatment and 92 percent of control) also believed their children would work for pay at age 30. These high expectations did not vary between treatment and control groups, providing no evidence that LLC affected youth or parent expectations for employment. LLC did increase expectations about educational attainment. About 46 percent of treatment group members expected to earn a college degree, a rate that was 9 percentage points higher than the control group rate of 37 percent (Table VI.1).

Table VI.1. Youth and parent reports on expectations

Outcome	Treatment mean	Control mean	Difference
Youth expectations			
Number of youth respondents	214	163	
Definitely or probably expects to work for pay at age 30 (percentage)	95.0	95.2	-0.2 (2.4)
Definitely or probably expects to earn enough to support themselves without financial help from family or government benefit programs (percentage)	70.8	74.9	-4.1 (4.9)
Expects to earn a college degree (percentage)	45.8	37.0	8.8* (5.0)
Parent expectations			
Number of parent respondents	**213**	**160**	
Expects youth to definitely or probably work for pay at age 30 (percentage)	91.2	91.8	-0.6 (3.0)
Expects youth to earn a college degree (percentage)	54.1	52.8	1.4 (5.2)

Source: LLC youth and parent follow-up surveys.

Notes: Samples sizes vary slightly across survey responses. We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of differences are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

LLC = Linking Learning to Careers.

VII. Conclusion

This report presents the impacts of LLC on important intended outcomes about two years after participants enrolled in the program. LLC offered high school students with disabilities a package of services to facilitate their transitions from school to young adulthood. These services emphasized paid and unpaid WBLEs along with college exploration and coursework opportunities at CCV, team-based guidance and support from VR staff, dedicated AT support, and transportation funding. Participants also had access to preemployment transition services and usual supports from DVR and other providers that were available to all youth with disabilities in Vermont. LLC implemented the program throughout the state, enrolling 413 participants into the treatment group and 390 in the control group. The implementation report (Martin et al. 2021) identified the essential services available to LLC participants during the first 18 months of their participation as (1) a dedicated staff member (the career consultant) with a small caseload, (2) a team of other staff who worked with the career consultant to address transition needs, (3) preemployment transition services, and (4) WBLEs. Because of the randomization process, in which participants either had access to LLC services or usual services, the impact estimates reflect the effects of the program rather than the effects of other factors that might have influenced outcomes. In this chapter, we summarize the estimated impacts, contextualize the findings, and discuss program and policy implications for state VR agencies and RSA.

A. Summary of impacts

LLC had the following impacts on participants within 24 months of their enrollment into the program:

- **Services.** LLC had a large impact on services in the two years after youth enrolled, particularly services that LLC intended to offer. These services included those related to WBLEs, AT, and postsecondary education as well as certain preemployment transition services. Nearly 70 percent of the treatment group had at least one WBLE recorded in DVR's administrative data, though only one-quarter (25 percent) met the primary outcome measure of having two WBLEs, including one paid.
- **Education.** LLC increased enrollment in postsecondary education institutions and, specifically, in CCV. This higher enrollment corresponds with LLC's positive impact on the use of postsecondary education services. LLC also increased expectations of attaining a college degree for youth.
- **Employment.** Overall, LLC did not affect employment outcomes. Similar percentages of treatment and control group members had earnings or paid work experiences within 24 months of program enrollment. The program did, however, increase the likelihood of earnings among later enrollees.

B. Contextualizing the findings

The demonstration's impacts on services and education are consistent with findings from the implementation evaluation and follow from the context of the DVR services that participants could access. LLC offered distinct services for WBLEs, postsecondary education, AT, and transportation as part of its program—services that youth in the control group could not access—and had positive impacts on many of these measures. The implementation report showed that about one-fifth of treatment group youth used many of these program-specific services. Although not all youth required these services, a certain proportion could have benefited, and LLC's offer of these services might have filled needed gaps, such as with schools playing a limited role in offering AT for employment-related needs. Youth's responses to the follow-up survey confirm the impact of LLC on the program's delivery of these services. The impacts on

service take-up were consistent with the program's logic model. LLC's relationship with CCV in particular likely played an important role in connecting youth to that postsecondary education institution.

The lack of consistent impacts on employment is inconsistent with the program's expectations. Offering high school students WBLEs, along with individualized supports to promote youth's success with those experiences, should have led to positive employment outcomes. We found no impacts, however, using administrative or survey data for all enrollees, though we did find impacts for those who enrolled in the later part of the program. Five reasons could explain the lack of consistent impacts.

- **Many youth entered the program with work experience.** Youth already working in competitive integrated employment might not benefit from the additional employment supports LLC offered, particularly unpaid WBLEs. The fact that more than half of treatment and control group members had already worked when they enrolled in the program suggests that many already had the skills and abilities to procure employment on their own or with naturally occurring supports. Focusing on a youth population with specific needs or limitations around employment might have resulted in more consistent employment impacts for LLC.
- **Most youth had not graduated high school by 24 months after enrollment.** Almost two-thirds of youth were still in high school at the time we measured the employment outcomes 24 months after they enrolled in the program. The remainder might have graduated or otherwise left high school recently before we conducted our evaluation activities. Assessing education and employment impacts at this point in their transition to young adulthood might be too early; the program could generate impacts in these areas in the years after youth leave high school, particularly if LLC promotes career awareness and options through the services it offered.
- **The COVID-19 pandemic might have affected employment opportunities.** Although the pandemic constricted the economy, particularly in sectors in which youth might be more likely to find jobs, we found little evidence from our analyses that this factor affected the employment of youth in the treatment and control groups.
- **Variation in program implementation across district offices could have diluted impacts.** In the implementation evaluation report (Martin et al. 2021) and this report, we document variation in program implementation across district offices. Inconsistent implementation of one or more aspects of the LLC model could dilute the program's impacts. We did not find strong evidence, however, that better implementation, in terms of the district-level impact for two or more WBLEs, consistently resulted in larger impacts for employment.
- **Either the counterfactual for LLC is particularly strong or the LLC intervention is not sufficiently different from usual services.** DVR's demonstration offered an opportunity to test the LLC model against usual DVR services with a select group of youth, and the estimated impacts should be interpreted within that context. The comparison group is not a broad group of youth with disabilities without access to transition services. Rather, the comparison group includes a large proportion of youth who already had some type of connection to DVR. DVR staff conducted initial outreach for LLC enrollment to high school students using DVR services, whether eligible or presumed eligible for VR, though they later expanded the pool to high school students with individualized education plans or section 504 plans. Those youth who had some engagement with DVR presumably would be well positioned to continue to use those services throughout and beyond high school. Alternatively, the LLC intervention—which built on usual VR services by emphasizing connections to WBLEs, expanded AT and postsecondary education services, and more personalized staff connections—might not have been sufficiently different from what youth typically accessed

through DVR. The services documented by administrative and survey data show that many control group members had access to and used an array of transition-related services, including those offered by DVR. Impacts might have been larger with a comparison group without such strong connections to services. Large, significant impacts on employment of participants who enrolled later in the demonstration (a group that had a smaller share of youth that were already connected to DVR) is consistent with this explanation.

DVR is well positioned to track service, education, and employment impacts beyond the 24-month period used for this evaluation. With its administrative data on services, it can follow youth's pathways through the DVR system, including identifying which youth continue to use services for education and employment. With regular analyses of state wage records, DVR can assess whether employment impacts emerge as youth leave high school and postsecondary education. And with data from the NSC, it can observe whether the early impacts with postsecondary education enrollment lead to postsecondary education completion and identify the types of credentials youth eventually obtain. Such information can bolster what DVR and the field learn from the LLC demonstration.

C. Program and policy implications for state VR agencies

Administrators from other state VR agencies might be interested in replicating LLC or a similar model in their states. If so, they might consider the following questions.

Should other state VR agencies implement LLC? LLC succeeded in delivering many aspects of its intended services and with increasing postsecondary education. These positive impacts, on their own, might be sufficient evidence for other agencies to develop a program using LLC's model. The program did not affect employment, however, during the initial 24 months after program enrollment. The positive impacts on postsecondary education could result in eventual educational attainment and employment impacts as youth enter young adulthood, but administrators might want additional evidence on the model's effectiveness.

To what extent can LLC be replicated in other states? On the surface, the LLC model could be replicated elsewhere. The core aspects of the model (that is, using a team-based approach with dedicated staff to offer paid and unpaid WBLEs, postsecondary education exploration and coursework opportunities, dedicated AT support, and transportation funding, all of which build on existing VR services) are within the capabilities of most VR agencies, as many have pivoted to offer more transition services since the passage of WIOA. Replicating the model, however, might require increased transition-related staffing and strong community partnerships, particularly with AT providers and one or more postsecondary education institutions.

If replicated, could administrators expect similar success? The answer is maybe. The youth who enrolled in LLC have characteristics that differ from the general population of special education students nationwide, which might affect the ability for an LLC-like program to have similar results. For example, the share of transition-age youth with a disability is higher in Vermont than in the United States overall, which could indicate higher prevalence or higher rates of diagnosis among students with less significant disabilities. The youth who enrolled in the demonstration were largely White, reflecting the broader population of Vermont. Most enrollees worked before they signed up for the program, and they and their parents had high expectations for youth's work, education, and independent living at baseline. The students who enrolled in LLC could therefore differ from typical students with disabilities receiving services from VR agencies.

D. Program and policy implications for RSA

With LLC and the other four demonstrations it funded, RSA established a foundation on which it could learn more about WBLE models and how they can promote outcomes for transition-age youth. RSA might consider the positive service and education impacts as promising indicators of the LLC model, particularly if future analyses find long-term impacts on educational attainment and employment. Because of the relatively young age of high school students, RSA and the broader transition community might benefit from a fuller understanding of how exposure to WBLEs and other services affect youth's career trajectories into young adulthood and beyond the limited period used for this and the other demonstration evaluations.

RSA could use the information learned from LLC and the other four demonstrations on service delivery and impacts in two ways. First, it could consider technical assistance options for state VR agencies as the agencies continue to offer transition services and develop collaborations around transition, particularly with secondary and postsecondary education institutions and community rehabilitation providers. This information might be particularly salient for RSA-funded technical assistance centers. Second, RSA could leverage information collected from youth who participated in the demonstrations to track the long-term outcomes that result from youth's exposure to WBLEs, other preemployment transition services, and other VR agency supports offered as part of the demonstrations. Such information could inform what we know about the long-term effects of these services on the career trajectories of youth with disabilities.

References

Cadigan, K., L. Craig-Unkefer, J. Reichle, P. Sievers, and V. Gaylord. (eds.). "Feature Issue on Supporting Success in School and Beyond for Students with Autism Spectrum Disorders." *Impact*, vol. 19, no. 3, Fall/Winter 2006/2007. Available at http://ici.umn.edu/products/impact/193/default.html.

Carter, E., D. Austin, and A. Trainor. "Predictors of Postschool Employment Outcomes for Young Adults with Severe Disabilities." *Journal of Disability Policy Studies*, vol. 23, no. 1, 2012, pp. 1–14.

Dundar, Afet, and Doug Shapiro. "WWC The National Student Clearinghouse as an Integral Part of the National Postsecondary Data Infrastructure." Washington DC: Institute for Higher Education Policy, 2016.

Institute of Education Sciences. "What Works Clearinghouse: Procedures and Standards Handbook (Version 3.0)." Washington, DC: Institute of Education Sciences, March 2014.

Institute of Education Sciences. "What Works Clearinghouse™ Standards Handbook, Version 4.1." Washington, DC: Institute of Education Sciences, 2020. Available at https://ies.ed.gov/ncee/wwc/Docs/referenceresources/WWC-Standards-Handbook-v4-1-508.pdf.

Federal Partners in Transition Strategic Planning Committee. "The 2020 Federal Youth Transition Plan: A Federal Interagency Strategy." Washington, DC: Office of Disability Employment Policy, 2015.

Fraker, Thomas, Arif Mamun, Todd Honeycutt, Allison Thompkins, and Erin Jacobs Valentine. "Final Report on the Youth Transition Demonstration Evaluation." Washington, DC: Mathematica Policy Research, 2014.

Gerhardt, Peter F., "Effective Transition Planning for Learners with ASD Approaching Adulthood." *Impact,* vol. 19, no. 3, Fall/Winter 2006/2007. Available at http://ici.umn.edu/products/impact/193/default.html.

Kalton, G., and I. Flores-Cervantes. "Weighting Methods." *Journal of Official Statistics,* vol. 19, no. 2, 2003, p. 81.

Lipscomb, Stephen, Joshua Haimson, Albert Y. Liu, John Burghardt, David R. Johnson, and Martha Thurlow. "Preparing for Life After High School: The Characteristics and Experiences of Youth in Special Education. Findings from the National Longitudinal Transition Study 2012. Volume 1: Comparisons with Other Youth." NCEE 2017-4016. Washington, DC: National Center for Education Evaluation and Regional Assistance, March 2017.

Martin, Frank, Kathleen Feeney, Todd Honeycutt, and David Mann. "Maryland's Way2Work Maryland Demonstration: Implementation Evaluation Report." Princeton, NJ: Mathematica, 2021.

Mazzotti, V.L., D.A. Rowe, S. Kwiatek, A. Voggt, W.-H. Chang, C.H. Fowler, M. Poppen, J. Sinclair, and D.W. Test. "Secondary Transition Predictors of Postschool Success: An Update to the Research Base." *Career Development and Transition for Exceptional Individuals*, vol. 44, no. 1, 2021, pp. 47–64.

Newman, L., M. Wagner, A.-M. Knokey, C. Marder, K. Nagle, D. Shaver, X. Wei, with R. Cameto, E. Contreras, K. Ferguson, S. Greene, and M. Schwarting. "The Post-High School Outcomes of Young Adults with Disabilities up to 8 Years After High School. A Report from the National Longitudinal Transition Study-2 (NLTS2)." NCSER 2011-3005. Menlo Park, CA: SRI International, 2011. Available at http://www.nlts2.org/reports.

U.S. Department of Education, Rehabilitation Services Administration. "The State Vocational Rehabilitation Services Program Before and After Enactment of the Workforce Innovation and Opportunity Act in 2014." Washington, DC: U.S. Department of Education, Office of Special Education and Rehabilitation Services, Rehabilitation Services Administration, 2020b. Available at https://www2.ed.gov/about/offices/list/osers/rsa/wioa/state-of-vr-program-after-wioa.pdf.

Schochet, Peter Z. "Statistical Power for Random Assignment Evaluations of Education Programs." *Journal of Educational and Behavioral Statistics*, vol. 33, no. 1, March 2008, pp. 62–87.

Shandra, C.L., and D.P. Hogan. "School-To-Work Program Participation and the Post-High School Employment of Young Adults with Disabilities." *Journal of Vocational Rehabilitation,* vol. 29, 2008, pp. 117–130.

Stapleton, D., and F. Martin. "What Have We Learned Using Merged Administrative Data from the Social Security Administration and the Rehabilitation Services Administration?" *Journal of Vocational Rehabilitation,* vol. 46, no. 2, 2017, pp. 121–136.

U.S. Government Accountability Office. "Students with Disabilities: Better Federal Coordination Could Lessen Challenges in the Transition from High School." Publication No. GAO-12-594. Washington, DC: U.S. Government Accountability Office, July 2012.

Wittenburg, D.C., and E. Maag. "School to Where? A Literature Review on Economic Outcomes of Youth with Disabilities." *Journal of Vocational Rehabilitation,* vol. 17, 2002, pp. 265–280.

Appendix A

Impact Evaluation Methods

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A. Introduction

In this appendix, we provide more information on the methods we used to estimate the impacts of the Linking Learning to Careers (LLC) demonstration in Vermont. The appendix serves as a supplement to Chapter II, which describes key components of the analytic framework and methods.

B. Testing baseline equivalence between experimental groups

As we describe in Chapter II, the analytic framework for estimating and interpreting impacts relies on the random assignment of participants to treatment and control groups. In theory, random assignment should result in treatment and control groups with similar characteristics and allow any observed differences in outcomes to be attributable to the intervention. In practice, especially with experimental groups as small as those for LLC, treatment and control groups could differ in some characteristics through chance. Large differences across experimental groups, however, would raise concerns that the random assignment was not executed successfully. To assess the integrity of the random assignment, we examined the baseline equivalence of the experimental groups.

We found that the treatment and control groups were similar across a large set of youth and parent characteristics and expectations (Table II.1). Youth characteristics include gender, race, age, grade level, types of disabilities, age at disability onset, self-reported health, whether the youth had an active vocational rehabilitation case, a 504 plan or an individualized education plan, receipt of Supplemental Security Income, eligibility for free or reduced-price school lunch, current or prior employment, and expectations for future education and employment. Parent characteristics include education, employment, and marital status. We used Student's t-test to evaluate differences in means between the treatment and control groups for binary and continuous variables. For categorical outcomes, we computed χ^2 statistics to determine whether the enrollee distribution across categories was consistent between the two groups. Differences between groups for all variables were small and statistically insignificant.

C. Estimating impacts and regression-adjusted differences

We use an intent-to-treat framework to estimate LLC's impacts. With intent to treat, the evaluation assesses impacts across all members of the treatment group regardless of their level of engagement with services. It does not estimate the impact of the actual program services on the youth that used them (whether any individual service or all of them as a package). Instead, it provides inference of what impact the program would have if replicated elsewhere in real world settings, with some youth using more services than others. We estimated all impact models in Stata 15.1.

1. Main analysis models

We used multivariate linear regression models with heteroskedastic-robust standard errors to estimate the impacts of LLC. Regression-adjusted estimates are more precise than unadjusted estimates because they account for variation across exogenous characteristics. With more precision, we can detect smaller program impacts. The general model specification is

$$y_i = \delta T_i + \beta X_i + \varepsilon_i \quad (1)$$

where y_i is the outcome for participant i, T_i is an indicator that equals one for participants in the treatment group and zero for participants in the control group, X_i is a vector of baseline characteristics, and ε_i is a random error term. The parameter δ represents the impact of LLC on outcome y.

Given baseline equivalence across characteristics and the relatively small sample size, we limited the vector X to characteristics that (1) we were most concerned could be correlated with program outcomes and (2) had sufficient variation. These include male gender (compared with female, non-binary, or other), non-White or Hispanic race or ethnicity, being in the 9th or 10th grade of high school at enrollment (compared with 11th or 12th), having a parent with a college degree, several non-mutually exclusive disability categories (attention-deficit/hyperactivity disorder, autism, emotional disorder, intellectual disability, learning disability, sensory disability), age at disability onset, and whether the youth received income from Supplemental Security Income. If these characteristics are indeed correlated with program outcomes, including them as covariates in the regression models should improve the precision of the estimates, allowing us to detect smaller impacts.

2. Weights for survey and earnings outcomes

We constructed and used weights to adjust estimates for nonresponse. Although we had data for all participants in the baseline survey, Division of Vocational Rehabilitation administrative data, and National Student Clearinghouse data, we did not have Vermont unemployment insurance wage data, youth follow-up survey data, or parent follow-up survey data for subsets of participants. We were able to obtain Vermont unemployment insurance wage data only for the 638 participants who provided their Social Security number (SSN) at random assignment, and only 378 youth and 374 parents completed the follow-up survey. We constructed three weights to adjust for this using propensity score methods (Kalton and Flores-Cervantes 2003). We used these weights when estimating impacts for survey-based or earnings outcomes to help ensure that the impact estimates reflect the entire analysis sample, not just survey respondents or those who provided their SSN.

3. Accounting for missing data

We addressed missing data based on how we used the data in the analysis and why the data were missing. If data were missing for a baseline characteristic used in the impact analysis as an explanatory variable, we used mean imputation to fill in the missing value. For outcome variables, we excluded from impact estimation participants with a missing value for the outcome.

D. Subgroup analyses

To understand how the impacts of LLC varied across key individual characteristics, we estimated impacts for selected subgroups. The subgroups are gender, impairment (has attention-deficit/hyperactivity disorder versus does not have it), grade level in high school at enrollment (9th or 10th versus 11th or 12th), and income-based eligibility for free or reduced-price school lunch. For each subgroup, the categories are mutually exclusive. We estimated subgroup impacts for the primary service and employment outcomes.

We chose these subgroups for two reasons. First, because each subgroup reflects characteristics that might influence how participants respond to the intervention, program impacts could vary substantively by subgroup. Estimating impacts for these subgroups enabled us to explore that variation. Second, the analysis sample was well partitioned across the subgroups being compared. The smaller a subgroup is, the more difficult it is to detect subgroup impacts. Because of the limited size of the LLC analysis sample,

detecting impacts for a small subgroup is especially difficult. By selecting subgroups with more balanced representation, we improved the probability of detecting subgroup impacts if any existed.

We estimated subgroup impacts using a modified version of the main regression model:

$$y_i = \vartheta S_{\gamma i} + \delta T_i + \theta S_{\gamma i} T_i + \beta X_i + \varepsilon_i \quad (2)$$

where $S_{\gamma i}$ is an indicator for being in subgroup γ that measures differences in outcome y between participants in that subgroup and those not in it. The parameter δ is the estimated impact of LLC on participants not in subgroup γ, and θ is the additional impact of LLC for participants in subgroup γ. The estimated impact of LLC on people in subgroup γ is the sum of δ and θ. To determine whether impacts vary across subgroups, we tested whether θ is statistically different from zero. The vector X includes the same covariates as the main regression model.

E. Presentation of impact estimates

We report several statistics with each impact estimate. To help readers contextualize the estimates, we report the outcome mean for the treatment and control group. We calculated the control group mean directly from the data, whereas we regression adjusted the treatment group mean. The impact estimate is the difference between the treatment and control group outcome means. We report each impact estimate with a heteroskedasticity-robust standard error that indicates the precision of the estimate. To identify significant impact estimates, we tested whether each one is statistically different from zero. We report whether the impact estimate's p-value was below key thresholds and highlight in the text and tables those impacts with p-values below 10 percent.

In Appendix D, we also present simple impact estimates—differences in treatment and control group means—for the three primary outcomes. Because of the demonstration's random assignment design, differences in mean outcomes across experimental groups are valid impact estimates. Despite being less precise than the main regression-adjusted impact estimates, simple impact estimates can reveal whether the main measures of LLC's efficacy are sensitive to regression model selection.

F. Multiple comparisons

Simultaneously estimating impacts on multiple outcomes increases the Type 1 error rate (that is, the risk of falsely finding impacts when the program did not truly have an impact). Though methods to adjust estimates for this exist, these methods can increase the Type 2 error rate (that is, the risk of falsely not finding impacts when the program truly did have an impact) (Schochet 2008). With the unavoidable challenge of detecting program impacts using the somewhat small LLC sample, we avoided the multiple comparisons tradeoff by selecting only one primary outcome within each of the three outcome domains that were key LLC components that applied to all treatment group members:

- Services: at least two WBLEs, including one paid, within 24 months of enrollment
- Education: enrolled in at least one postsecondary education course by December 2020
- Employment: had at least one quarter of earnings within the eight quarters after enrollment

All non-primary outcomes are supplementary outcomes. Though important to understanding the effects of the intervention, the supplementary outcomes do not constitute the main assessment of LLC's impact.

G. What Works Clearinghouse evaluation design rating

An important objective of the LLC evaluation design was to provide evidence of the LLC model that met the highest What Works Clearinghouse (WWC) evaluation design rating (that is, the study design meets WWC standards without reservations). Achieving this rating is a strong indicator of a rigorous evaluation design and thus provides confidence in the validity of the findings. To receive the highest design rating, an evaluation must (1) be a randomized controlled trial, (2) have low levels of sample attrition, and (3) have at least one outcome that meets criteria for a quality measure (Institute for Educational Studies 2020).

The LLC evaluation meets WWC standards for a randomized controlled trial. The WWC standards require that a randomized controlled trial assigns each study enrollee to a treatment or control group entirely by chance with a nonzero probability. For LLC, we randomly assigned each enrollee with equal probability to the treatment group or the control group using an algorithm within our modular, web-based management information system known as RAPTER®. The random assignment algorithm in RAPTER® ensures randomizing study enrollees properly. Furthermore, Table II.1 reveals strong baseline covariate balance between treatment and control group members after random assignment. Though not definitive proof, the baseline covariate balance between treatment and control groups is evidence that we conducted random assignment correctly. Between understanding the algorithm responsible for random assignment and observing strong baseline covariate balance, we are confident in the integrity of random assignment.

Table A.1. Comparison of overall and differential attrition against WWC standards, for measuring primary employment outcome

	Participants	Provided SSN (N)	Provided SSN (%)	Attrition (%)	WWC attrition threshold (%)
Total	803	638	79.4	20.5	55.0
Treatment group	413	339	82.1	17.9	
Control group	390	299	76.7	23.3	
Differential attrition				5.4	5.4

SSN = Social Security number; WWC = What Works Clearinghouse.

We must also meet the WWC standards for attrition. Attrition occurs when the evaluation lacks an outcome variable for a study enrollee. Certain levels of attrition can compromise the comparability of the treatment and control groups, potentially biasing estimates of the intervention's outcomes. WWC standards examine two types of attrition: overall attrition—the rate of attrition for the entire sample—and differential attrition—the difference in rates of attrition between the treatment and control groups. Both types of attrition must be low to achieve the highest WWC design rating, which the standards refer to as "tolerable levels of potential bias for both the optimistic and cautious sets of assumptions."

When we examine overall and differential attrition, we find that the data we used to measure the three primary outcomes meet WWC's criteria for low overall and differential sample attrition. For the service outcome measured using Division of Vocational Rehabilitation administrative data and the postsecondary outcome measured using National Student Clearinghouse data, attrition is a non-issue because we have data on all participants. Measurement of the primary employment outcome, however, was limited to those participants who provided a valid SSN. The 638 participants that did provide SSN represent 79 percent of the sample for an overall sample attrition rate of 21 percent. The rate was slightly higher among the

treatment group (82 percent) than the control group (77 percent), for a differential attrition rate of 5.4 percent. The combination of the 21 percent sample attrition rate and the 5.4 differential attrition rate are within the WWC's cautious boundary for attrition.

To receive the highest rating, WWC standards also require that at least one outcome meets review requirements and is free of confounding factors. Both the primary service and education outcomes meet this review requirement. These measures have face validity because they are clearly defined, and the content they assess aligns with their definitions. Because the measures are recorded in the same manner for both experimental groups, and because we observe strong baseline covariate balance across groups, we are confident that no component of the study design or feature of implementation for these measures is perfectly aligned or confounded with either experimental group.

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Appendix B

Additional Impact and Supplementary Outcomes Estimates

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Table B.1. Differential impacts of LLC on receipt of two WBLEs, including one paid, by personal characteristics and timing of enrollment

Subgroup	Treatment mean	Control mean	Impact estimate (T vs. C)	Treatment N	Control N
Disability type					
Does not have ADHD	25.0	13.4	11.6*** (3.8)	225	202
Has ADHD	24.9	4.8	20.1*** (3.5)	188	188
Differential treatment impact			8.5 (5.2)		
Enrollment cohort					
Early	23.9	12.2	11.7*** (4.1)	174	164
Late	25.5	7.1	18.4*** (3.3)	239	226
Differential treatment impact			-6.7 (5.2)		
Grade at enrollment					
10	22.3	7.1	15.2*** (3.6)	189	182
11	27.1	11.1	16.0*** (3.7)	224	208
Differential treatment impact			-0.1 (5.2)		
Gender					
Male	23.1	6.5	16.6*** (3.1)	254	232
Not male	27.3	13.3	14.0*** (4.4)	159	158
Differential treatment impact			2.6 (5.4)		
Free or reduced-price school lunch eligibility					
Eligible	24.8	6.3	18.5*** (3.4)	214	205
Not eligible	24.9	12.4	12.5*** (4.0)	199	185
Differential treatment impact			6.0 (5.3)		

Source: DVR administrative data and LLC baseline survey.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

ADHD = attention-deficit/hyperactivity disorder; DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; WBLE = work-based learning experience.

Table B.2. Differential impacts of LLC on having at least one quarter with earnings, by personal characteristics and timing of enrollment

Subgroup	Treatment mean	Control mean	Impact estimate (T vs. C)	Treatment N	Control N
Disability type					
Does not have ADHD	62.6	61.4	1.2 (5.4)	183	152
Has ADHD	69.0	60.5	8.5 (5.3)	156	147
Differential treatment impact			7.3 (8.0)		
Enrollment cohort					
Early	65.2	70.2	-5.0 (5.8)	142	120
Late	66.0	54.8	11.2** (4.9)	197	179
Differential treatment impact			-16.2 (8.0)**		
Grade at enrollment					
10	61.2	52.0	9.2 (5.8)	155	133
11	69.0	68.1	1.0 (5.0)	184	166
Differential treatment impact			8.2 (7.6)		
Gender					
Male	66.2	61.2	5.1 (4.9)	206	177
Not male	64.7	60.7	4.1 (5.9)	133	122
Differential treatment impact			1.0 (7.8)		
Free or reduced-price school lunch eligibility					
Eligible	63.4	59.4	4.1 (5.3)	178	160
Not eligible	68.2	62.8	5.3 (5.3)	161	139
Differential treatment impact			1.3 (7.5)		

Source: Vermont wage records and LLC baseline survey.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

ADHD = attention-deficit/hyperactivity disorder; LLC = Linking Learning to Careers.

Table B.3. Impacts of LLC on primary service and employment outcomes within 24 months of enrollment, by district office at enrollment

District office	Treatment mean	Control mean	Impact estimate (T vs. C)	Treatment N	Control N
Barre-Montpelier					
Services: Had at least two WBLEs, including one paid	28.5	2.7	25.8*** (8.3)	36	37
Employment: Had at least one quarter of earnings	79.0	72.4	6.6 (13.6)	29	29
Bennington					
Services: Had at least two WBLEs, including one paid	9.9	5.4	4.5 (5.8)	38	37
Employment: Had at least one quarter of earnings	53.3	61.1	-7.9 (12.0)	38	36
Brattleboro					
Services: Had at least two WBLEs, including one paid	32.3	2.9	29.3*** (9.7)	39	34
Employment: Had at least one quarter of earnings	56.8	41.4	15.4 (13.1)	36	29
Burlington					
Services: Had at least two WBLEs, including one paid	21.1	4.2	16.9** (6.6)	49	48
Employment: Had at least one quarter of earnings	77.1	63.0	14.1 (9.0)	47	46
Middlebury					
Services: Had at least two WBLEs, including one paid	44.3	0.0	44.3*** (12.1)	17	12
Employment: Had at least one quarter of earnings	86.9	91.7	-4.8 (12.4)	17	12
Morrisville					
Services: Had at least two WBLEs, including one paid	27.1	9.1	18.0* (9.9)	34	33
Employment: Had at least one quarter of earnings	64.0	51.6	12.4 (11.6)	32	31
Newport					
Services: Had at least two WBLEs, including one paid	53.4	20.6	32.8*** (11.6)	35	34
Employment: Had at least one quarter of earnings	69.4	63.2	6.2 (13.0)	27	19
Rutland					
Services: Had at least two WBLEs, including one paid	18.9	15.2	3.7 (9.9)	34	33
Employment: Had at least one quarter of earnings	63.2	81.3	-18.1 (26.3)	17	16

District office	Treatment mean	Control mean	Impact estimate (T vs. C)	Treatment N	Control N
Springfield					
Services: Had at least two WBLEs, including one paid	18.8	3.7	15.1* (8.3)	29	27
Employment: Had at least one quarter of earnings	79.8	35.3	44.5** (17.5)	15	17
St. Albans					
Services: Had at least two WBLEs, including one paid	26.0	29.0	-3.0 (13.5)	34	31
Employment: Had at least one quarter of earnings	67.6	74.2	-6.6 (12.8)	34	31
St. Johnsbury					
Services: Had at least two WBLEs, including one paid	30.4	16.1	14.3 (12.7)	34	31
Employment: Had at least one quarter of earnings	60.0	60.0	0.0 (22.9)	25	15
White River Junction					
Services: Had at least two WBLEs, including one paid	6.3	0.0	6.3 (7.1)	34	33
Employment: Had at least one quarter of earnings	46.5	50.0	-3.5 (19.7)	22	18

Source: DVR administrative data and Vermont unemployment insurance data.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; WBLE = work-based learning experience.

Table B.4. Sensitivity of estimates for primary outcomes to sample restrictions

Outcome	Treatment mean	Control mean	Difference
Number of students in demonstration			
Number that completed 24-month survey	214	164	
Number in early cohort	174	164	
Number in late cohort	239	197	
Services: Had at least two (one CIE) WBLEs since enrollment (all)	24.9	9.3	15.6*** (2.6)
Students that completed 24-month survey	27.0	13.4	13.6*** (4.1)
Early cohort	23.9	12.2	11.7*** (4.1)
Late cohort	25.5	7.1	18.4*** (3.3)
Education: Ever enrolled in postsecondary education (all)	30.6	22.4	8.2*** (3.1)
Early cohort	34.5	25.5	9.0*** (4.1)
Late cohort	24.5	17.6	6.9 (4.6)
Employment: Worked in paid employment (all)	65.6	61.0	4.7 (3.8)
Students that completed 24-month survey	63.3	63.3	0.0 (5.0)
Early cohort	65.2	70.2	-5.0 (5.8)
Late cohort	66.0	54.8	11.2** (4.9)

Source: DVR administrative data, NSC data, and Vermont unemployment insurance data.

Note: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

CIE = competitive integrated employment; DVR = Division of Vocational Rehabilitation; NSC = National Student Clearinghouse; WBLE = work-based learning experience.

Table B.5. Other service outcomes within 24 months of enrollment

Variable	Treatment mean	Control mean	Difference
Number of respondents	214	164	
Service source			
DVR	44.1	25.7	18.4*** (4.9)
Different agency serving people with disabilities	12.4	9.9	2.4 (3.1)
An American Job Center	0.7	1.2	-0.4 (0.9)
A high school or other secondary school	40.8	48.1	-7.3 (5.2)
A postsecondary school	8.8	5.1	3.7 (2.7)
Some other place	6.9	3.4	3.5 (2.4)
Job-specific services			
Took tours of workplaces	39.3	33.2	6.1 (4.9)
Participated in a job shadow	36.2	44.1	-8.0 (5.1)
Interviewed someone about their job	24.3	19.2	5.1 (4.3)
Regularly talked one on one with someone about jobs	42.8	50.7	-7.9 (5.1)
Regularly talked as part of a group with someone from outside school about jobs	30.3	30.3	0.0 (4.8)
Had a paid internship or apprenticeship	12.3	16.4	-4.1 (3.7)
Had an unpaid internship or apprenticeship	16.1	13.6	2.4 (3.7)
Worked in a school-based enterprise	19.4	26.9	-7.4 (4.4)
Types of services needed but not received			
Discovering job interests and job skills	4.5	4.1	0.4 (2.1)
Career counseling	2.6	4.0	-1.5 (1.8)
Learning how to look for a job	4.1	3.8	0.3 (2.1)
Job shadowing	3.3	3.5	-0.2 (1.9)
An apprenticeship or internship	1.7	3.0	-1.3 (1.6)
Help finding a job	6.2	4.6	1.6 (2.4)
Support on the jobs, such as job coaching	2.7	3.9	-1.2 (1.9)
Help getting into school or training	2.0	3.7	-1.8 (1.8)
Understanding SSA or other benefits	1.5	2.3	-0.7 (1.5)
Computer literacy classes	1.6	1.7	-0.1 (1.4)
Problem solving	4.2	4.8	-0.6 (2.2)
Financial literacy training	1.7	2.9	-1.2 (1.5)
Referral to another agency	0.5	1.8	-1.4 (1.1)
Transportation services	5.0	1.9	3.1 (1.9)
Health-related services	0.5	1.5	-1.0 (1.0)
Case management	1.0	1.5	-0.5 (1.1)
Other services	0.6	2.5	-1.9 (1.3)

Variable	Treatment mean	Control mean	Difference
AT			
Always or often use AT tools	26.6	21.6	5.0 (4.4)
Very satisfied with AT tools[a]	53.7	31.0	22.6** (8.8)
Received assistance with AT	57.1	44.5	12.6 (9.2)
Very satisfied with AT assistance[b]	47.6	57.5	-9.9 (14.0)

Source: LLC youth 24-month follow-up survey.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

[a] We measured satisfaction and estimated means only among those that use AT tools.

[b] We measured satisfaction and estimated means only among those that received assistance with AT tools.

AT = assistive technology; DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; SSA = Social Security Administration.

Table B.6. Other education and training outcomes within 24 months of enrollment

Variable	Treatment mean	Control mean	Difference
Number of youth respondents	**214**	**164**	
Type of institution enrolled in at time of interview			
High school	61.0	68.3	-7.3 (5.3)
High school that serves only participants with disabilities	2.3	3.3	-1.0 (1.8)
School that provides occupational or technical training, usually less than two years	9.6	9.0	0.6 (3.8)
Two-year community college	9.8	5.4	4.5 (2.8)
Four-year college	11.1	9.0	2.1 (3.4)
Another type of school	5.5	5.1	0.4 (2.5)
Highest degree or level of school completed			
Some high school, no diploma	37.0	40.1	-3.2 (4.4)
High school with diploma or equivalent	46.1	52.9	-6.8 (4.9)
Certificate of completion	1.2	1.8	-0.6 (1.1)
Trade, technical, or vocational training	2.5	1.8	0.6 (1.6)
Associate degree	0.0	0.0	--
Bachelor's degree or higher	0.0	0.0	--
Any other type of degree or schooling	2.3	0.0	2.3* (1.2)
Some college, no diploma	10.9	3.4	7.5*** (2.8)
In the past year, youth learned the following leadership activities			
Working in a team	60.5	59.3	1.2 (5.7)
Making decisions	70.3	68.7	1.5 (5.4)
Handling conflict	62.9	63.0	-0.1 (5.4)
Number of parent respondents	**214**	**160**	
Youth received special education services or had an individualized education plan	83.1	77.9	5.2 (4.3)
Youth had a section 504 plan	9.9	13.3	-3.4 (3.5)
Youth had a transition planning meeting to help plan what they might do after high school	78.1	76.5	1.6 (5.0)
The youth's role in transition planning			
Provided some input	42.2	26.1	16.1*** (5.3)
Took a leadership role	18.5	26.9	-8.4* (4.8)
At the transition planning meeting			
The youth's interests, strengths, and preferences were discussed	75.2	72.0	3.2 (5.1)
Staff from a community service agency took part	47.5	33.6	13.9** (5.5)
The youth received information on education, careers, or community living options for when they leave high school	57.2	48.9	8.3 (5.5)
Parent or guardian helped the youth prepare for life after high school through the following activities			
Attended a career day or job fair	34.3	31.8	2.5 (5.7)

Variable	Treatment mean	Control mean	Difference
Arranged to attend a program or take a tour of a college campus	51.7	52.3	-0.6 (5.7)
Arranged to sit in on or take a college class	40.2	29.7	10.5** (5.3)
Arranged to participate in an internship or apprenticeship related to career goals	37.0	37.7	-0.7 (5.8)
Arranged to work or volunteer in a job related to career goals	50.1	52.7	-2.6 (5.8)
Searched the Internet for college options or read college guides	44.8	50.8	-6.0 (5.9)
Talked with a high school counselor about their options for life after high school	68.6	60.1	8.5 (5.5)
Talked about options with a counselor hired by family to help the participant prepare for college admission	11.1	10.1	0.9 (3.3)
Arranged to take a course to prepare for a college admission exam such as the SAT or ACT	24.0	14.8	9.2** (4.4)

Source: LLC youth and parent 24-month follow-up surveys.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

LLC = Linking Learning to Careers.

Table B.7. Other employment outcomes within 24 months of enrollment

Variable	Treatment mean	Control mean	Difference
Number of respondents	**214**	**164**	
Employed in past year	79.2	83.8	-4.6 (4.0)
Number of jobs in the past year	1.4	1.4	0.0 (0.1)
Characteristics of most recent job			
Job was paid	87.9	95.3	-7.4** (3.2)
Employed at time of survey	62.1	63.5	-1.4 (5.5)
Part of a school-sponsored activity	11.9	15.7	-3.8 (4.0)
Youth very or somewhat satisfied	89.7	83.7	6.0 (3.8)
Characteristics of last paid job			
Wage for those paid hourly ($)	12.0	11.9	0.1 (0.3)
Benefits			
Health insurance	13.1	5.5	7.6** (3.3)
Paid vacation, holidays, or sick days	13.6	12.4	1.2 (3.9)
Retirement	8.1	7.3	0.8 (3.1)
Supports received			
Work clothes or uniforms	43.8	51.2	-7.5 (5.8)
Work-related equipment	16.3	24.2	-7.8* (4.6)
Transportation	23.8	29.4	-5.6 (4.8)
Assistive technology	7.5	7.7	-0.3 (3.0)
Accommodations	43.0	47.3	-4.3 (5.8)
Other supports	7.0	9.7	-2.7 (3.0)
How youth found job			
Vermont Division of Vocational Rehabilitation	12.0	7.1	4.8 (3.5)
Friends, relatives, or colleagues	38.8	43.8	-5.0 (5.5)
School	15.7	18.3	-2.6 (4.3)
Other	31.2	30.1	1.1 (5.3)
Number of participants with SSN	**339**	**299**	
Any earnings across 8 quarters	65.6	61.0	4.7 (3.8)
1st quarter after enrollment	28.6	27.9	0.6 (3.6)
2nd quarter after enrollment	32.1	30.1	2.1 (3.7)
3rd quarter after enrollment	36.0	35.7	0.3 (3.8)
4th quarter after enrollment	36.2	38.5	-2.3 (3.9)
5th quarter after enrollment	39.1	40.9	-1.8 (3.9)
6th quarter after enrollment	40.3	39.7	0.6 (3.9)
7th quarter after enrollment	45.2	43.0	2.2 (3.9)
8th quarter after enrollment	46.8	42.9	3.9 (4.0)
Earnings amount across 8 quarters ($)	6,258.3	6,774.5	-516.2 (717.2)
1st quarter after enrollment ($)	369.1	428.8	-59.7 (69.1)
2nd quarter after enrollment ($)	437.6	527.0	-89.4 (86.7)

Variable	Treatment mean	Control mean	Difference
3rd quarter after enrollment ($)	661.2	749.9	-88.7 (107.2)
4th quarter after enrollment ($)	644.7	688.8	-44.1 (100.9)
5th quarter after enrollment ($)	710.3	787.0	-76.6 (102.9)
6th quarter after enrollment ($)	940.6	1,013.7	-73.1 (148.2)
7th quarter after enrollment ($)	1,142.1	1,260.0	-117.9 (155.1)
8th quarter after enrollment ($)	1,352.6	1,319.3	33.3 (169.0)
Any earnings by calendar quarter			**169.0**
Q1 2019	31.0	36.5	-5.5 (3.7)
Q2 2019	36.4	39.7	-3.3 (3.8)
Q3 2019	45.8	43.5	2.3 (3.8)
Q4 2019	42.8	40.9	1.8 (3.8)
Q1 2020	44.6	42.1	2.5 (3.8)
Q2 2020	40.1	35.0	5.1 (3.7)
Q3 2020	45.7	42.6	3.1 (3.8)
Q4 2020	44.7	44.3	0.4 (3.9)
Earnings by calendar quarter			
Q1 2019 ($)	494	591	-96.7 (86.6)
Q2 2019 ($)	555	665	-109.8 (90.1)
Q3 2019 ($)	1,045	1,204	-159.5 (144.4)
Q4 2019 ($)	1,021	1,066	-45.4 (144.0)
Q1 2020 ($)	1,011	1,052	-41.2 (144.4)
Q2 2020 ($)	988	1,090	-102.4 (154.9)
Q3 2020 ($)	1,592	1,605	-13.3 (191.6)
Q4 2020 ($)	1,954	1,734	219.8 (230.6)

Source: LLC youth 24-month follow-up surveys and Vermont unemployment insurance data.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

LLC = Linking Learning to Careers; Q = quarter; SSN = Social Security number.

Table B.8. Expectations for the future, reported 24 months after enrollment

Variable	Treatment mean	Control mean	Difference
Number of youth respondents	**214**	**164**	
Expectations for living situation at age 30			
With a parent or guardian	9.3	10.4	-1.2 (3.4)
With a sibling or other relative	3.3	2.7	0.6 (1.8)
On their own or with spouse or partner	78.0	79.2	-1.2 (4.5)
In a group home or institution	0.1	1.5	-1.3 (1.0)
In another living situation	3.5	1.9	1.6 (1.8)
Number of parent respondents	**214**	**160**	
Parent expects youth to definitely or probably earn enough to support self without financial help from family or government benefit programs	66.0	68.3	-2.3 (4.9)
Parent expectations for youth's living situation at age 30			
With a parent or guardian	16.9	13.6	3.2 (4.1)
With a sibling or other relative	1.9	4.2	-2.3 (1.7)
On their own or with spouse or partner	62.5	62.1	0.3 (5.3)
In a group home or institution	2.2	2.6	-0.3 (2.2)
In another living situation	8.6	10.4	-1.8 (3.1)

Source: LLC youth and parent 24-month follow-up surveys.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

LLC = Linking Learning to Careers.

Appendix C

Unadjusted Impacts of LLC on Primary Outcomes

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Table C.1. Unadjusted differences in primary outcomes between treatment and control groups within 24 months of enrollment

Outcome	Treatment mean	Control mean	Difference
Number of participants	**413**	**390**	
Services: Had at least two WBLEs, including one paid	24.9	9.2	15.7*** (2.6)
Education: Ever enrolled in postsecondary education	30.6	22.4	8.2*** (3.1)
Number of participants with SSN	**339**	**299**	
Employment: Had at least one quarter of earnings	66.0	61.0	5.0 (3.9)

Source: DVR administrative data and Vermont unemployment insurance data.

Notes: We regression adjusted treatment means and differences to account for baseline characteristics. Standard errors of the impact estimates are in parentheses.

*/**/*** Difference is significantly different from zero at the .10/.05/.01 levels, respectively, using a two-tailed t-test. Significance thresholds are not adjusted for multiple comparisons.

DVR = Division of Vocational Rehabilitation; SSN = Social Security number; WBLE = work-based learning experience.

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