

Pre-employment transition and vocational rehabilitation services: Experiences in response to Vermont's work-based learning program

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Abstract.

BACKGROUND: State vocational rehabilitation (VR) agencies offer pre-employment transition services (pre-ETS) and other VR services to high school students, but the literature has not documented differences in pre-ETS use by individual characteristics or across individual services.

OBJECTIVE: We describe variation in how high school students used services from the Vermont VR agency and how a demonstration program emphasizing work-based learning experiences affected that use.

METHOD: The study uses a descriptive approach to explore patterns in youth's pre-ETS and VR services and outcomes two years after enrolling in a demonstration program. It compares youth with access to demonstration services (the treatment group) to those using usual services (the control group).

RESULTS: Among all control group youth, more than half only used pre-ETS during a 24-month period, while about one-quarter used VR services and the remainder used no services from the VR agency. In contrast, nearly all treatment group youth used some VR services, with a majority (59 percent) using both VR services and pre-ETS. Control group youth who used pre-ETS and VR services differed from those who did not use these services by gender, disability type, employment, and service receipt characteristics; treatment group youth had fewer such differences. Earnings outcomes did not vary in consistent or interpretable ways.

CONCLUSION: The findings demonstrate how an intervention designed to promote work-based learning experiences increased pre-ETS and VR use and decreased subgroup differences in service utilization. VR administrators might consider collecting information on potentially eligible students to increase access to and use of services.

Keywords: Vocational rehabilitation, pre-employment transition services, high school students, youth with disabilities, Linking Learning to Careers

1. Introduction

The Workforce Innovation and Opportunity Act (WIOA; Pub. Law. 113–128, 128 Stat. 1425, July 22,

2014), enacted in 2014, significantly changed how state vocational rehabilitation (VR) agencies worked with students with disabilities. Before WIOA, federal regulations limited VR agencies to serving students only after the agency deemed them eligible for VR services. Since WIOA, VR agencies can offer pre-employment transition services (pre-ETS) to students who have not yet applied but are potentially eligible

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for VR services and can offer these services to groups of students. In addition, agencies must allocate at least 15 percent of their federal grant funds to pre-ETS for students with disabilities (RSA, 2020). Such a shift is warranted by the perennially low employment outcomes for this population. In 2020, for example, 17 percent of youth with disabilities ages 16 to 19 and 35 percent of youth ages 20 to 24 worked; the corresponding numbers for youth without disabilities were 29 percent and 61 percent (Bureau of Labor Statistics, 2021).

We have little information thus far on how students use pre-ETS, whether those who use pre-ETS go on to apply for VR services, and how their outcomes differ from those of youth who do not use these services. These gaps in the knowledge base are problematic because VR agencies have pivoted toward students and youth with disabilities in recent years and done so with little evidence about the demand for VR services among youth. In program year 2020, more than half of those using services from VR agencies were age 24 or younger (RSA, 2021).

This study fills gaps in the field's knowledge about pre-ETS. We comprehensively describe how high school students used services from a single VR agency as part of a state-wide demonstration project funded by the Rehabilitation Services Agency (RSA), which is part of the U.S. Department of Education. We leveraged the administrative data from the VR agency to identify how students were typically connected to the agency's services. Because the VR agency offered additional services to help youth transition to young adulthood on top of the agency's usual services as part of the demonstration, we also observed whether that program increased VR involvement and its resultant outcomes, including earnings.

1.1. Pre-ETS implementation and challenges

Pre-ETS include five required services: counseling on opportunities for enrollment in comprehensive transition or postsecondary educational programs, instruction in self-advocacy, counseling on job exploration, work-based learning experiences (WBLEs), and workplace readiness training. These services stand apart from the services that VR agencies offered historically. People who apply to VR, are assessed as eligible for services, and establish an individualized plan for employment can use VR services to achieve

their specific employment goals. Pre-ETS offers a broad but limited set of services to encourage youths' transition from school to employment and education during young adulthood. The evidence supporting these five services is positive, though much of the research is derived from correlational or qualitative analyses or reflects an intervention that included the service as a package of other services (Frentzel et al., 2021).

Pre-ETS has strengthened the role of VR agencies in the transition process. Recent studies show the shifts toward serving youth and young adults that VR agencies have made by providing pre-ETS. Before WIOA, the percentage of VR users younger than age 24 was roughly one-third (RSA, 2020). In program year 2018 (after WIOA implementation), the percentage increased to more than half of VR service users, and students with disabilities represented more than one-third of VR caseloads. Moreover, that share of students with disabilities did not reflect potentially eligible students who used pre-ETS (those students who had not applied for VR services, but are presumed eligible), which may establish a gateway for students to apply to VR agencies for additional services. Pre-ETS are often provided directly by VR agency staff, though agencies more frequently use purchased services for WBLEs (Honeycutt et al., 2019). A review of state plans intended to identify content related to pre-ETS showed that agencies, in their attempt to address WIOA requirements, have focused on improving the employment skills of students; developing opportunities that emphasize community-based employment; and building partnerships with employers, local education agencies, postsecondary education institutions, and families (Taylor et al., 2021).

VR agency staff have encountered numerous challenges in offering pre-ETS to students. The roles of VR counselors can involve working more with youth and schools than with adults, and the increased number of students who are potentially eligible has had corresponding effects on caseloads, paperwork burdens, and time management (Fabian et al., 2018). RSA (2020) documented other fiscal and operational challenges of implementing pre-ETS requirements, including agencies moving into an order of selection because of increased demands in serving youth and shifting resources to students with disabilities from the broader adult population (limiting VR services to all people with disabilities within a state).

1.2. *The Linking Learning to Careers demonstration program*

The Vermont Division of Vocational Rehabilitation (DVR) (which recently changed its name to HireAbility Vermont) built on its existing transition program to offer services to high school students through the Linking Learning to Careers (LLC) demonstration program. DVR designed the program to emphasize work-based learning experiences (WBLE) and provide an individualized approach to promoting students' confidence and planning for their futures. RSA funded DVR to implement and evaluate LLC as one of five RSA-sponsored demonstration projects that evaluated models of early work experiences for students with disabilities.

LLC leveraged DVR's usual services for high school students to emphasize unpaid and paid WBLEs in integrated environments. Usual services comprise those services that are typically available to students, such as pre-employment transition services and (for those who are eligible) employment and training services. LLC also provided college exploration and coursework opportunities at the Community College of Vermont, team-based guidance and support from VR staff, dedicated assistive technology support, and additional transportation funding to support participation. To facilitate WBLE opportunities and service delivery, DVR funded transition counselors, career consultants, and youth employment specialists, some of whom only worked LLC caseloads, in each of its 12 district offices. Only LLC participants (treatment group youth) could access LLC-specific services and staff, and they could use other pre-ETS and services as VR clients. (All participants could access pre-employment transition services, but only participants with an open DVR case were eligible for other DVR services). Youth in the control group could access usual DVR services but did not have access to LLC-specific services or the dedicated staff who were part of the program. Table 1 shows the DVR services available to treatment group youth (LLC services) and control group youth (that is, usual services) (Martin et al., 2021; Sevak et al., 2021).

From April 2017 to December 2018, DVR recruited 803 students with disabilities to participate in the LLC demonstration. Using a random assignment process, DVR assigned 413 students to the treatment group with access to enhanced LLC services and 390 to a control group with access to usual services. DVR staff conducted initial outreach for

LLC enrollment to high school students who were already using DVR services, whether eligible or presumed eligible for VR; these youth typically had individualized education programs or Section 504 plans. Later, they expanded the pool to high school students not yet enrolled with DVR but who met the same eligibility requirements. The LLC evaluation tracked services and outcomes through the first 24 months after enrollment, though students could continue to use DVR services after that point.

This paper does not present findings on the impacts of the LLC demonstration, but instead takes a closer look at service patterns of youth in the treatment and control groups to understand better how youth typically used pre-ETS and VR services. The LLC impact evaluation found that (1) LLC had a large impact on VR service use in the two years after youth enrolled, particularly those services that LLC intended; (2) LLC increased participation in postsecondary education by 8 percentage points; and (3) LLC did not affect employment for all participants within the first 24 months of program enrollment, though it increased the likelihood of earnings among later enrollees by 11 percentage points. These findings were limited in that they only used a 24-month window from enrollment, and many enrollees had not yet completed high school. Full details of the LLC evaluation can be found in Martin et al. (2021) and Sevak et al. (2021).

1.3. *Study objectives*

This study relies on data from DVR and the LLC program evaluation to answer three questions related to patterns of service use and resulting outcomes:

- What were students' typical service patterns with pre-ETS and VR services during a 24-month period?
- How did those service patterns differ for youth who had access to LLC?
- How did earnings outcomes vary by youth's service patterns?

The answers to these questions fill gaps in our knowledge regarding how high school students access pre-ETS and VR services (that is, what are their service patterns), which youth use which services, how a transition program can affect the service patterns, and differences in early outcomes according to service patterns.

Table 1
DVR services available to LLC treatment and control group youth

Services available to the treatment group	Services available to the control group
WBLEs	
<p>LLC's 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 to align youth's interests with job opportunities.</p>	<p>Control group youth were eligible to pursue WBLEs as part of pre-employment transition services and could use online assessment tools, but completion of three WBLEs was not a goal.</p>
Pre-employment transition services	
<p>Pre-employment transition services were available for treatment and control group youth, but pre-employment transition services for treatment group youth were embedded within the LLC framework and provided by the LLC team.</p>	<p>All students with disabilities, including those with an individualized education program, section 504 plan, or documented disability, were eligible for pre-employment transition services. Such services help students with disabilities advocate for themselves, gain employment experience, and prepare for life after high school.</p>
VR services	
<p>Services for VR clients were the same for treatment and control group youth.</p>	<p>Students determined 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.</p>
Planning tools	
<p>LLC staff used optional planning tools developed specifically for LLC, including the LLC Career Pathway Plan, to gather treatment group youth's short- and long-term career goals for their transition after high school.</p>	<p>Staff who provided services to control group youth could use other non-LLC planning tools.</p>
AT services	
<p>LLC staff referred treatment group youth 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.</p>	<p>VR staff could offer AT support to control group youth who were within six months of high school graduation. The VR program could not, however, purchase equipment or devices for control group youth, and any AT that high schools provided remained with the school, not the student, upon graduation. Control group youth would need to visit one of three AT Centers in the state for services.</p>
Postsecondary education services	
<p>In collaboration with the CCV system, LLC offered several enhanced postsecondary education services for treatment group youth, including campus tours, 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 youth to better understand the links between their academics and career objectives.</p>	<p>Control group youth could receive vouchers to cover the tuition for two college courses worth up to four credits each at participating institutions.</p>
Transportation services	
<p>LLC offered additional funds to support treatment group youth's 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.</p>	<p>Control group youth 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.</p>

Note. AT = Assistive Technology; CCV = Community College of Vermont; DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; VR = Vocational Rehabilitation; WBLE = Work-Based Learning Experience.

2. Methods

This analysis uses data collected on DVR service delivery and outcomes from the LLC evaluation, which had a sample of 803 high school students. It uses descriptive analyses to explore how youth in the control group used the services offered by DVR and tracks their outcomes. It then contrasts those statistics with similar calculations for the youth in the treatment group to assess the differences between the two groups.

2.1. Sample

This study examines the 803 high school students who signed up for the LLC demonstration. Participants' characteristics at the time of random assignment to the treatment and control groups were largely similar (Table 2). A majority of participants were White, about 60 percent identified as male, and just over half were enrolled in grades 11 or 12. The most common disability types included learning disabilities and attention-deficit/hyperactivity disorder. Nearly a fifth of participants received income from the Supplemental Security Income or Social Security Disability Insurance programs. One-third of participants had a paid job when they enrolled. The few small differences in characteristics between the treatment and control groups (about 3 to 5 percentage points) were not statistically significant.

Participants were similar to youth with disabilities ages 14 to 18 in Vermont and the United States across most characteristics, but they differed in potentially meaningful ways. Compared with youth with disabilities in Vermont, a slightly higher share of students in the demonstration were non-White or of Hispanic ethnicity. The percentage of participants reporting employment experience (33 percent) was substantially higher than the 24 percent employment rate among youth with disabilities in Vermont (based on our calculations from the 2017 and 2018 American Community Survey); this difference might reflect the motivations of youth interested in the LLC demonstration or youth who typically use pre-ETS and VR services (from which the program largely drew its sample). Differences by race and employment are even more pronounced when comparing demonstration participants with similarly aged youth with disabilities in the United States. The percentage of participants reporting a particular disability was higher than the percentage in published statistics on students with disabilities in Vermont

(Vermont Agency of Education, 2016) and nationally (National Center for Education Statistics, 2021), but this finding could be because of measurement differences. The LLC baseline survey allowed students to report multiple disabilities, and education statistics report mutually exclusive categories, grouping students with multiple disabilities in one category.

2.2. Data

This analysis draws on four data sources for information on demonstration assignment, youth and family characteristics, DVR involvement, and earnings outcomes. *LLC enrollment data* identify which participants LLC randomized to the treatment and control groups, their application dates, and the district office associated with their applications. Youth and families completed web-based *baseline surveys* at enrollment that contained almost 50 items. Along with the characteristics shown in Table 2, the surveys also collected information about other demographic and disability characteristics, employment history, expectations for the future, and information about their parents. *DVR administrative data* are service records input by DVR staff about application, service, and outcomes related to a person's DVR involvement. From these data, we identified participants' use of vocational and rehabilitative services from April 2017 to June 2021. These data include all 803 demonstration participants and represent services used by youth (including purchased services) and VR agency milestones (such as application and eligibility dates). Finally, we analyzed *Vermont unemployment insurance data* for earnings outcomes, which contain quarterly earnings as reported by employers to the state. DVR obtained these data from the Vermont Department of Labor for the 638 demonstration participants who provided Social Security numbers to DVR at the time of random assignment.

2.3. Measures

We use three types of measures in our analysis: youth and family characteristics, DVR services and milestones, and earnings outcomes.

2.3.1. Youth and family characteristics

From the baseline data, we coded the following indicators of whether they: identified as male, female, non-binary or other gender; identified as White, non-Hispanic, another race, or Hispanic ethnicity; were enrolled in (a) grades 9 or 10 or (b) grades 11

or 12 or had other education status at enrollment; had at least one parent or guardian with a college degree; received special education services (including having an individualized education program); received Supplemental Security Income or Social Security Disability Insurance because of a disability; and were working at the time of enrollment. We also coded the youth's disability type (attention-deficit disorder or attention-deficit/hyperactivity disorder, autism spectrum disorder, emotional disorder [including behavioral disorder or emotional disturbance], intellectual disability, learning disability, sensory disability [speech, hearing, or visual], physical disability, or other disability not listed); when the youth's disability or condition was first identified (before kindergarten or during school); whether the enrolling parent was married or cohabitating; and whether the enrolling parent earned any income in the past year.

2.3.2. DVR services and milestones

From DVR's service records, we captured various VR service measures and milestones for each student during the first 24 months after enrollment. These measures include students' DVR status at the time of enrollment (pre-application student, DVR client, or no DVR involvement); whether students applied for DVR services and were found eligible; their use of pre-ETS (counseling on enrollment opportunities, instruction in self-advocacy, job exploration counseling, WBLEs, and workplace readiness training), including the number of service types; and their use of DVR services (career services, training services, or other services, excluding pre-employment transition services).

2.3.3. Earnings outcomes

Using the state's unemployment insurance wage records, we tracked whether a student had any earn-

Table 2
Characteristics of Vermont LLC control and treatment group youth

Characteristics at enrollment	Control group youth (%)	Treatment group youth (%)
Number of participants	390	413
Gender		
Male	59	62
Female, non-binary, or other gender	41	38
Race and ethnicity		
White alone and not Hispanic	84	82
Hispanic or non-White race	16	18
Grade level		
9 or 10	47	46
11 or 12, missing, and other	53	54
Has ever been identified as having		
ADD or ADHD	48	46
Autism spectrum disorder	16	16
Emotional disorder	39	35
Intellectual disability	10	11
Learning disability	50	49
Sensory disability	31	27
Physical disability or other	19	15
When disability or condition was first identified		
Before kindergarten	38	37
School age	62	63
Service receipt		
Receives special education services	83	80
Receives SSI or SSDI benefits disability	19	18
Employment		
Worked at time of enrollment	33	34
Parent or guardian characteristics		
At least one parent has a college degree	36	37
Married or cohabitating	62	62
Any earned income in the past year	82	81

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; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

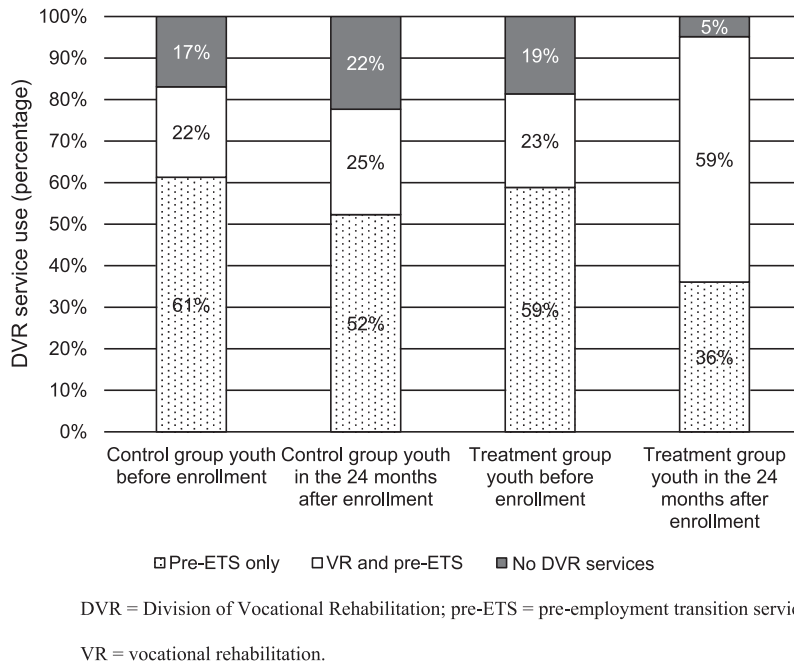


Fig. 1. DVR involvement at enrollment and during the 24 months after enrollment. This figure shows the proportion of treatment (N = 413) and control (N = 390) youth according to their DVR service involvement at enrollment and 24 months after enrollment.

ings in each of eight quarters beginning the quarter after enrollment (representing a 24-month period). For each quarter, we created a binary indicator for any earnings. Across all eight quarters, we created a summary measure for the number of quarters with earnings.

2.4. Analytical approach

This exploratory analysis relies on two analytical approaches to answer the study’s research questions. First, we use descriptive statistics, such as counts, means, and percentages, to document youth and family characteristics, DVR services and milestones, and earnings outcomes. Second, we use *t*-tests and chi-square tests to assess which youth and family characteristics are significantly associated with selected outcomes and whether the treatment and control groups differed in their service patterns.

3. Results

3.1. Service patterns for control and treatment group youth

Similar shares of control and treatment group youth began their involvement with the demonstra-

tion after having some exposure to DVR (Fig. 1). Most youth were pre-application students, so they had access to pre-ETS before enrollment. The remainder of enrollees had no prior DVR involvement or had an open VR case; the proportions of both groups were roughly similar, indicating that the control and treatment groups youth had comparable engagement with DVR before LLC enrollment.

Though control and treatment group youth had similar DVR statuses at enrollment, more treatment group youth used pre-ETS and VR services in the 24 months after enrollment than did control group youth (Fig. 1). Among all control group youth, more than half only used pre-ETS, and one-quarter also received VR services under an individualized plan for employment (and might have also used pre-ETS). In addition, 22 percent did not use any VR services. In contrast, nearly all treatment group youth used some VR service, and a majority (59 percent) used both VR services and pre-ETS. Five percent of treatment group youth did not use any services from DVR. These results indicate that although the treatment and control groups had similar eligibility for VR services and pre-ETS at enrollment, LLC involvement brought with it greater engagement in pre-ETS and VR services relative to the control group.

Table 3
Characteristics of youth who did and did not use pre-ETS

Characteristics at enrollment	Control group youth who did not use pre-ETS (%)	Control group youth who used pre-ETS (%)	Treatment group youth who did not use pre-ETS (%)	Treatment group youth who used pre-ETS (%)
Number of participants	88	302	28	385
Gender				
Male	70.5	56.3**	57.1	61.8
Female, non-binary, or other gender	29.5	43.7**	42.9	38.2
Race and ethnicity				
White alone and not Hispanic	81.8	85.1	78.6	82.6
Hispanic or non-White race	18.2	14.9	21.4	17.4
Grade level				
9 or 10	48.9	46.0	50.0	45.5
11 or 12, missing, and other	51.1	54.0	50.0	54.5
Has ever been identified as having				
ADD or ADHD	47.7	48.3	42.9	45.7
Autism spectrum disorder	9.1	18.5**	14.3	16.4
Emotional disorder	45.5	37.7	42.9	34.0
Intellectual disability	8.0	10.9	7.1	11.4
Learning disability	47.7	50.3	39.3	50.1
Sensory disability	25.0	32.1	25.0	27.5
Physical disability or other	19.3	18.5	14.3	15.3
When disability or condition was first identified				
Before kindergarten	35.2	39.1	35.7	36.6
School age	64.8	60.9	64.3	63.4
Service receipt				
Receives special education services	69.3	87.1***	71.4	80.8
Receives SSI or SSDI benefits	13.6	20.2	7.1	18.7
Employment				
Worked at time of enrollment	40.9	30.8*	39.3	33.2
Parent or guardian characteristics				
At least one parent has a college degree	29.5	37.4	35.7	37.1
Married or cohabitating	59.1	62.9	50.0	62.3
Any earned income in the past year	85.2	81.1	71.4	82.1

Note. Pre-ETS use is based on youths' DVR involvement in the 24 months after their enrollment. */**/** Difference in percentage among youth using pre-ETS and youth not using pre-ETS is significantly different from zero at the .10/.05/.01 levels, respectively. ADD = Attention Deficit Disorder; ADHD = Attention-Deficit/Hyperactivity Disorder; DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

3.2. Individual characteristics related to pre-ETS

The pre-ETS usage rates for control group youth suggest substantial differences in the types of youth who used pre-ETS. Among control group youth, those who used pre-ETS differed from those who did not by gender, disability type, employment, and service receipt characteristics (Table 3). Males, for example, represented 71 percent of control group youth who did not use pre-ETS and 56 percent of those who did, a difference of 14 percentage points. Control group youth who used pre-ETS were 10 percentage points less likely to be employed at enrollment, 9 percentage points more likely to report an autism spectrum disorder, and 15 percentage points more likely to receive special education services, relative to their counterparts who did not use pre-ETS.

Youth in the treatment group had no significant differences in the characteristics of those who used

pre-ETS and those who did not (Table 3). The lack of differences reflects the LLC program's intent to connect most program youth to pre-ETS, but it could also result from the small number of youth ($N=28$) who used no services (that is, a few differences between those who did and did not use pre-ETS were 10 percentage points or higher, but were not statistically significant). The program's additional resources, such as dedicated staff to connect with youth and service offerings, could have appealed more widely to the needs of youth, thus resulting in the large number of youth using pre-ETS.

3.3. Patterns of pre-ETS use

Most pre-ETS users in the control group used job exploration counseling services, with the group evenly split between the number of pre-ETS types that they used (Table 4). Nearly four in five con-

Table 4
Type and intensity of pre-ETS among youth who used pre-ETS

	Control group youth who used pre-ETS		Treatment group youth who used pre-ETS	
	N	Percentage	N	Percentage
Total	302	100.0	385	100.0
Pre-ETS type				
Counseling on enrollment opportunities	143	47.4	250	64.9***
Instruction in self-advocacy	74	24.5	97	25.2
Job exploration counseling	242	80.1	334	86.8***
WBLE	108	35.8	284	73.8***
Workplace readiness training	111	36.8	125	32.5
Number of pre-ETS types used				
1	97	32.1	61	15.8***
2	95	31.5	94	24.4
3 or more	110	36.4	230	59.7

Note. Pre-ETS use is based on youths' DVR involvement in the 24 months after their enrollment. ***/*** Difference in percentages between control and treatment groups is significantly different from zero at the .10/.05/.01 levels. Chi-square test used for number of pre-ETS types used. DVR = Division of Vocational Rehabilitation; pre-ETS = pre-Employment Transition Services; WBLE = Work-Based Learning Experience.

control group youth used job exploration counseling services, and about half received counseling on enrollment opportunities. Less than 40 percent of control group members used other pre-ETS types. Control group youth who used pre-ETS were roughly equally divided by whether they used a single pre-ETS type, two types, or three or more types.

LLC affected how youth used pre-ETS. Though the most frequent pre-ETS type remained job exploration counseling, most treatment group youth also used WBLEs or counseling on enrollment opportunities (Table 4). Treatment group youth were significantly more likely to use those three services than control group youth, which reflects LLC's service model to connect youth with various kinds of pre-ETS. Rates for the use of instruction in self-advocacy and workplace readiness training were no different from the rates for control group youth. Nearly 60 percent of treatment group pre-ETS users engaged with three or more types of pre-ETS, a significantly larger share than that of control group youth.

3.4. Individual characteristics related to VR service use

The composition of control group youth with VR service use differed from control group youth without VR service use by gender, grade level, and disability type. The largest difference occurred by grade level. Almost three-fourths (71 percent) of VR service users were in grades 11 or 12, whereas only 47 percent of those who did not use VR services were, a difference of 23 percentage points. Fewer VR service users were male (17 percentage points) or had a learning disabili-

ty diagnosis (14 percentage points), and more VR service users had a sensory disability diagnosis (9 percentage points), relative to youth who did not use VR services (Table 5). Notably, there were no statistically significant differences between youth who did and did not use VR services by race or ethnicity, parent or guardian background, most disability types, Supplemental Security Income or Social Security Disability Insurance status, or employment.

Compared with control group youth, treatment group youth who did and did not use VR services only differed along one characteristic. More treatment group youth who used VR services were in grades 11 or 12 (by 14 percentage points) relative to those who did not use VR services; this difference is much smaller than that observed for control group members (Table 5). This pattern suggests that LLC led to an increase in service use among some groups who would otherwise have had lower participation rates.

3.5. Earnings outcomes by service patterns

Most control group youth had earnings, no matter their pre-ETS and DVR involvement. Control group youth had an average of three earnings quarters across the first eight quarters after enrollment, and 61 percent had earnings in at least one quarter (Table 6). Among those using specific pre-ETS, youth who used WBLEs had the highest average quarters with earnings (3.6 quarters) and any quarters of earnings (71 percent). Other youth whose earnings outcomes were higher than average included those who used both

Table 5
Characteristics of youth who did and did not use VR services

Enrollment characteristics	Control group youth who did not use VR services (%)	Control group youth who used VR services (%)	Treatment group youth who did not use VR services (%)	Treatment group youth who used VR services (%)
Number of participants	291	99	169	244
Gender				
Male	63.9	46.5***	60.4	62.3
Female, non-binary, or other gender	36.1	53.5***	39.6	37.7
Race and ethnicity				
White alone and not Hispanic	82.8	88.9	81.7	82.8
Hispanic or non-White race	17.2	11.1	18.3	17.2
Grade level				
9 or 10	52.6	29.3***	54.4	39.8***
11 or 12, missing, and other	47.4	70.7***	45.6	60.2***
Has ever been identified as having				
ADD or ADHD	49.5	44.4	49.1	43.0
Autism spectrum disorder	15.1	20.2	13.0	18.4
Emotional disorder	38.1	43.4	31.4	36.9
Intellectual disability	9.6	12.1	13.6	9.4
Learning disability	53.3	39.4**	47.3	50.8
Sensory disability	28.2	37.4*	27.8	27.0
Physical disability or other	18.6	19.2	16.6	14.3
When disability or condition was first identified				
Before kindergarten	38.1	38.4	34.9	37.7
School age	61.9	61.6	65.1	62.3
Service receipt				
Receives special education services	82.1	85.9	76.9	82.4
Receives SSI or SSDI benefits	17.5	22.2	14.8	20.1
Employment				
Worked at time of enrollment	34.0	30.3	30.2	36.1
Parent or guardian characteristics				
At least one parent has a college degree	36.1	34.3	40.8	34.4
Married or cohabitating	62.2	61.6	60.9	61.9
Any earned income in the past year	82.5	80.8	83.4	79.9

Note. VR service use is based on youths' DVR involvement in the 24 months after their enrollment. */**/** Difference in percentage among youth using VR services and youth not using VR services within the control or treatment group is significantly different from zero at the .10/.05/.01 levels. ADD = Attention Deficit Disorder; ADHD = Attention-Deficit/Hyperactivity Disorder; DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income.

pre-ETS and VR services, used counseling on enrollment opportunities, or used two of the five pre-ETS types.

Treatment and control group youth had similar earnings outcomes (Table 6). Treatment group youth had an average of three earnings quarters, and 66 percent had earnings in at least one of the eight quarters after the enrollment quarter. Treatment group youth who used WBLEs or who only used one pre-ETS type had among the highest earnings outcomes relative to other types of DVR involvement. Unlike the control group youth, treatment group youth had similar earnings outcomes for those who used both pre-ETS and VR services and those who used pre-ETS only. (Among control group youth, the former group had higher rates than the latter group.)

The variation in earnings outcomes across youth with different DVR involvement should not be inter-

preted as causal. The observed relationships between service use and outcomes might be attributable to the observable and unobservable characteristics of youth, such as need, opportunity, motivation, or parental support, as well as local labor markets that are correlated with service use and outcomes.

4. Discussion

This study adds to the growing literature on pre-ETS by leveraging the rich information DVR collected on youth at baseline to illuminate whether use of pre-ETS differed across groups. To our knowledge, this study is the first to explore the characteristics of high school youth who use pre-ETS and VR services. Most VR agencies collect minimal information on youth who use pre-ETS and have little or no information on students who do not use pre-ETS, making

Table 6
Earnings outcomes eight quarters after enrollment by DVR involvement and pre-ETS use

	Control group youth			Treatment group youth		
	N	Any quarters with earnings (%)	Number of earnings quarters	N	Any quarters with earnings (%)	Number of earnings quarters
Total	299	61.0	2.99	339	66.0	3.06
DVR involvement through 24 months						
None	60	62.3	3.12	15	59.0	2.78
Pre-ETS only	162	56.7	2.76	123	65.8	3.01
Pre-ETS and VR services	76	67.4	3.26	194	67.0	3.18
Pre-ETS type						
Counseling on enrollment opportunities	113	63.0	3.13	208	69.8	3.35
Instruction in self-advocacy	65	51.6	2.45	85	61.1	2.53
Job exploration counseling	191	57.5	2.76	278	63.7	2.89
WBLE	87	70.8	3.60	237	70.7	3.42
Workplace readiness training	86	57.5	2.64	101	50.8	2.02
Number of pre-ETS types used						
1	80	55.1	2.87	45	70.4	3.53
2	66	68.0	3.11	78	65.9	2.99
3+	92	59.2	2.86	195	65.3	3.08

Note. Number of participants is limited to youth who shared Social Security numbers with LLC at enrollment. Earnings observed within eight quarters after the quarter of LLC enrollment. One control group youth and seven treatment group youth used only VR services; we omitted this category from the DVR and pre-ETS calculations. DVR = Division of Vocational Rehabilitation; LLC = Linking Learning to Careers; pre-ETS = pre-Employment Transition Services; VR = Vocational Rehabilitation; WBLE = Work-Based Learning Experience.

it difficult or impossible to study differential use patterns by race and ethnicity, gender, disability type, or other characteristics. The study has the advantage of examining the experiences of youth exposed to a transition program focused on WBLEs (the treatment group) and youth who were interested in the program but received usual services from the VR agency (the control group). The results document outcomes for youth by patterns of service use, though most youth were still in high school when we measured these outcomes.

4.1. Limitations

Readers should consider four limitations as they interpret the findings of this study. First, this study uses data from a single VR agency, which could limit the generalizability of some results. Second, the LLC program emphasized WBLEs and so likely attracted students with disabilities whose interest in employment was stronger than the interests of the broader group of all students with disabilities. Most students were connected to DVR in some manner before enrolling in LLC, and one-third had previous employment experience. The findings may not generalize to a broader group of students with disabilities that includes those with no previous VR agency engagement. Third, we examine service patterns and outcomes only for the first 24 months after LLC enrollment. Because most youth were still enrolled

in high school, this window might be too short to draw firm conclusions about how the patterns relate to earnings outcomes. The final limitation reflects our descriptive analytic approach to answering its research questions and the relatively small sample for some subgroups, which affects the interpretation of the results (that is, the results are not causal and we have limited power to detect effects).

4.2. Policy and program implications

VR agency administrators, staff, and clients, along with community members and advocates interested in VR, face multiple decisions regarding the programs and services for students and other youth with disabilities. The findings from this study provide some insight into three core questions that VR administrators and others interested in youth transition might ask.

4.2.1. Differences in who uses pre-ETS and VR services

An intentional, comprehensive approach to offering VR services to youth, similar to LLC, can increase youth's involvement with a VR agency. In Vermont, different types of youth with disabilities used VR services under typical conditions. These differences raise questions about who takes up the offer of VR services. For example, despite all youth being interested enough in signing up for LLC, the male control group

youth were less likely to use pre-ETS or VR services, and control group youth in higher grades were more likely to access VR services. These two findings are consistent with another study that examined the characteristics of youth and VR service use (Honeycutt et al., 2017), though that study and another (Yin et al., 2021) found differences in service use by race and ethnicity that were not observed in Vermont. We can only speculate on the reasons for the differences in Vermont and elsewhere, such as a lack of interest in usual VR services, motivation for employment, opportunities to find employment through other means, or outreach by VR staff. Regardless of the reason, after youth received the offer of LLC, we no longer observed most differences in youth's characteristics and their VR involvement.

Other VR agencies might have differences in which youth use their services, yet they may not be aware of those differences because they have limited information on the characteristics of potentially eligible youth. VR administrators might consider ways to collect information on potentially eligible students that is similar to that which they collect for youth who apply for VR services and track their involvement. Such information could identify whether some youth use services at higher or lower rates than might be expected. If so, then administrators could investigate why and whether the agency could improve its connections to services for youth who are potentially underserved.

Another aspect of this question reflects the reach of VR agencies in the community and the types of youth who come to the VR door. With LLC, roughly a third of control and treatment group youth were employed at the time they enrolled in the demonstration. This rate is higher than the national employment rate of transition-age youth with disabilities. The prevalence of prior work history could reflect either the youth who signed up for pre-ETS and VR more broadly or the outreach conducted specifically for the LLC demonstration. Regardless, this group might not be the ones most in need of pre-ETS and so be better served by other VR services focused on career advancement or higher education.

4.2.2. Program features to promote pre-ETS and VR service use and eliminate differences across subgroups

LLC highlights potential ways to better engage high school students. Many control group youth did not use services from DVR despite their eligibility and interest, whereas treatment group youth followed

a different path. The fact that youth in the treatment group used more services suggests that the program offered services in such a way as to interest youth and thus lead to higher VR engagement, particularly with youth applying for and using VR services. In contrast to usual VR services, LLC had dedicated staff for the program with smaller caseloads than those of DVR transition counselors and employment specialists offering usual services (Martin et al., 2021). It also emphasized employment and work-based learning, which is appealing to many high school students. These aspects of the program, plus the offer of specific services such as postsecondary education and assistive technology, might have led treatment group youth to increase their engagement with DVR. Although this resource-intensive approach might not be cost-efficient for usual transition programming, VR administrators might consider how staffing and service offerings can improve youth engagement.

4.2.3. The relationship between VR services and better outcomes

The descriptive results shown in this article for specific types of VR involvement reveal a range of outcomes 24 months after enrollment into LLC without a consistent pattern. The receipt of more services was not indicative of better outcomes, and receiving fewer (or no) services did not necessarily reflect poorer outcomes.

However, youth who used WBLEs had higher rates of any earnings across eight quarters as well as more quarters with earnings, relative to youth using the other pre-ETS. The finding was consistent for both treatment and control group members. This pattern is not causal, as youth who engaged in WBLEs could have had characteristics that would have led them to paid employment in the absence of their use of WBLEs, but it is consistent with the wide body of evidence that youth's work experiences lead to paid work (such as the review by Frentzel et al. (2021)).

The inconsistent evidence on outcomes for this study is in-line with the mixed results on the effectiveness of VR services from other studies. A study of Oklahoma youth (Osmani et al., 2022) found no relationship between participation in programs that offered work experiences and VR case closure, relative to youth who used typical VR services. Other studies, however, identify positive relationships between specific work-related VR services (such as job search and job placement services) and VR case closure (Alsaman et al., 2016; Awsumb et al., 2020) and between successful VR case closure

and earnings six years after case closure (Martin et al., 2020).

The mixed evidence might reflect the idiosyncratic nature of services and youths' specific needs. Findings from the LLC impact evaluation (Sevak et al., 2021) showed that, in addition to increased service use broadly, LLC youth had higher postsecondary education enrollment and, for the later cohort of enrollees, greater earnings. Though these findings from the LLC evaluation indicate a positive relationship between VR services and intended outcomes, more evidence is required to observe education and employment after youth leave high school, as most youth were still in high school two years after enrollment.

5. Conclusion

This study provides evidence from one state VR agency on the characteristics of high school youth who used VR services, including pre-ETS. Most youth, under usual conditions, were relatively light users of pre-ETS, and most did not seek VR services through an individualized plan for employment. When youth had access to a transition program that emphasized WBLEs, their engagement with the VR agency increased. Differences in the characteristics of youth using pre-ETS and VR services suggest that some youth might be more or less interested in what VR agencies offer. VR agency administrators and others interested in youth transition might seek ways to understand which youth are and are not using VR services as a means to improve service access and use across groups. Vermont's experience also shows that agencies can successfully connect youth with specific services and programs.

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Conflict of interest

The authors have no conflict of interest to report.

Ethics statement

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Informed consent

Participants in the Linking Learning to Careers demonstration provided written informed consent to participate in the study.

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