



# What Works to Promote Competitive Integrated Employment Among People with Disabilities?

## A Systematic Evidence Review

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## Acronyms

Acronym	Meaning
ACCESS	Achieving Competitive, Customized Employment Through Specialized Services
AIDD	Administration on Intellectual and Development Disabilities
APA	American Psychological Association
ASD	autism spectrum disorder
CART	classification and regression tree
CE	customized employment
CECY	California Employment Consortium for Youth
CIE	competitive integrated employment
CRP	community rehabilitation provider
DEI	Disability Employment Initiative
DOL	U.S. Department of Labor
FFY	federal fiscal year
GAO	Government Accountability Office
GGD	Guided Group Discovery
HCBS	home and community-based services
I/DD	intellectual and developmental disabilities
ID	intellectual disability
ICI	Institute for Community Inclusion at the University of Massachusetts, Boston
IEP	Individualized Education Plan
LGTW	Let's Get to Work Wisconsin
LLC	Linking Learning to Careers
NR	not reported
NS	not significant
OR	odds ratio
PIE	Partnerships in Employment
Pre-ETS	pre-employment transition services
QED	quasi-experimental design
RCT	randomized controlled trial
RSA	Rehabilitation Services Administration
SE	supported employment
SIS-A	Supports Intensity Scale® - Adult version
SNI	social needs index
SSDI	Social Security Disability Insurance
SSI	Supplemental Security Income
SWE	subminimum wage employment
SWTCIE	Subminimum Wage to Competitive Integrated Employment
TA	technical assistance
TBI	traumatic brain injury

## Acronyms

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Acronym	Meaning
TI	title
TIAB	title or abstract
TPSID	Transition and Postsecondary Education Programs for Students with Intellectual Disability
USWI	Utah School-to-Work Initiative
VBI	video-based intervention
VIT-TAY	Virtual Interview Training for Transition Age Youth program
VR	vocational rehabilitation
VR-JIT	Virtual Reality Job Interview Training program



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## Executive Summary

### A. Introduction

In September 2022, the Rehabilitation Services Administration awarded five-year grants for the federal fiscal year 2022 Disability Innovation Fund demonstration project. The grants provide 14 state vocational rehabilitation agencies with funding to implement Subminimum Wage to Competitive Integrated Employment (SWTCIE) Innovative Model Demonstration projects, which are intended to decrease subminimum wage employment and increase competitive integrated employment (CIE) among people with disabilities currently employed in or contemplating subminimum wage employment. To do so, the projects will create innovative models for dissemination and replication to (1) identify strategies for addressing barriers associated with accessing CIE, (2) provide integrated services that support CIE, (3) support integration into the community through CIE, (4) identify and coordinate wraparound services for project participants who obtain CIE, (5) develop and disseminate evidence-based practices, and (6) provide entities holding section 14(c) certificates with readily accessible transformative business models for adoption.

This systematic evidence review distills findings from the literature investigating programs, services, supports, and strategies that encourage CIE among people with disabilities. The review also considers the effectiveness of such interventions and the strength of the evidence when presenting these findings. The findings will inform state SWTCIE projects' implementation plans and Mathematica's design for the national evaluation of the SWTCIE demonstration as well as provide other interested parties with evidence to guide their decision making related to this topic.

### B. Primary research questions

The systematic evidence review addresses several research questions (Exhibit ES.1).

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#### Exhibit ES.1. Research questions for the systematic evidence review

Level	Research questions
Barriers to CIE	<ol style="list-style-type: none"><li>1. What common barriers do people with disabilities working in or considering SWE face when seeking CIE?</li><li>2. What common barriers do 14(c) certificate holders face when transforming their service models to promote CIE and transition from SWE?</li><li>3. What common barriers do state service systems experience when ending SWE?</li></ol>
Person-level	<ol style="list-style-type: none"><li>1. What policy-relevant programs, interventions, and strategies have been documented to encourage CIE among people with disabilities working in or considering SWE?</li><li>2. What research exists on the effectiveness of policy-relevant programs, services, and strategies to encourage CIE among people with disabilities working in or considering SWE?</li><li>3. What common barriers do people with disabilities working in or considering SWE face when seeking CIE?</li></ol>

Level	Research questions
14(c) certificate holder or provider-level	<ol style="list-style-type: none"> <li>1. What policy-relevant programs, interventions, and strategies have been documented to help 14(c) certificate holders and service providers successfully transform their service models to promote CIE or transition from SWE?</li> <li>2. What research exists on the effectiveness of policy-relevant programs, interventions, and strategies for 14(c) certificate holders and service providers to successfully transform their service models in promoting CIE or transitioning from SWE?</li> <li>3. What common barriers do 14(c) certificate holders or service providers face when transforming their service models to promote CIE or transition from SWE?</li> </ol>
System-level	<ol style="list-style-type: none"> <li>1. What policy-relevant programs, interventions, and strategies have been documented to encourage CIE or end SWE at the system-level?</li> <li>2. What research exists on the effectiveness of policy-relevant programs, interventions, and strategies to encourage CIE or end SWE at the system-level?</li> <li>3. What common barriers do state service systems experience when promoting CIE or ending SWE?</li> </ol>

CIE = competitive integrated employment; SWE = subminimum wage employment.

### C. Methods

The national evaluation team searched established research databases and gray literature for descriptive and causal evidence that met the following inclusion criteria and informed the research questions of interest:

- Written in English
- Published since 2012
- Focused on employment programs, interventions, or strategies that improve CIE
- Implemented in the United States
- Served a relevant population of people with disabilities

The search terms identified publications that include one or more terms relevant to people with disabilities, 14(c) certificates, subminimum wage employment, CIE, and disability status. The national evaluation team searched the databases for research that includes one or more terms containing “disability” and one or more terms related to CIE in the title, plus one or more terms related to subminimum wages or 14(c) certificates in the titles or abstracts. The team began with a focus on people working in subminimum wage employment or considering it, but few articles arose from this search, indicating a dearth of literature on this topic. The team then expanded the relevant population to people with disabilities older than age 16. Through this search strategy, we identified 72 publications that met the inclusion criteria and appear in this review documenting promising interventions to help people with disabilities transition to CIE. This comprised 13 experimental studies, nine literature reviews, and 50 descriptive studies.

### D. Key findings

The main findings from descriptive studies include the following:

- Paid work experiences in high school, job-related skills training delivered through a collegiate postsecondary education program, and supported employment or customized employment are

## Executive summary

associated with positive impacts on employment outcomes (Qian et al. 2018; Southward and Kyzar 2017; Joshi et al. 2012; Wagner et al. 2014; Carter et al. 2012).

- Six states offered students with disabilities opportunities to gain work experience and develop job skills and other funded activities through Partnerships in Employment. Many Partnerships in Employment states that changed systems created state policy changes to promote CIE among people with intellectual and developmental disabilities to achieve positive employment outcomes. (Butterworth et al. 2017; Christensen et al. 2017; Jones-Parkin et al. 2021; Molfenter et al. 2017; Raynor et al. 2017, 2018; Tucker et al. 2017).
- A panel of experts identified the top 10 characteristics of successful organizations that transformed to focus on CIE. A follow-up intervention applied these characteristics and identified increases associated with four indicators of job development: person-centered planning, Discovery, engagement with family or friends, and time spent with employers (Lyons et al. 2018, 2022).
- An analysis of national employment 2017 service data for 30 states found that, on average, states spend less per person annually in facility-based work settings than on integrated employment, \$9,746 and \$7,847, respectively (National Council on Disability 2020).

This systematic evidence review identified six studies with a high evidence assessment rating, one with a moderate evidence assessment rating, and six with a low evidence assessment rating. Across all rating assessments, most studies found mixed impacts on employment outcomes (Exhibit ES.2).

### Exhibit ES.2. Overview of evidence assessment ratings assigned to RCTs and QEDs identified in the systematic evidence review

Direction of impact	High evidence assessment rating	Moderate evidence assessment rating	Low evidence assessment rating
Positive impacts	Virtual Reality Job Interview Training (Smith et al. 2014)	None	Project SEARCH ASD (Wehman et al. 2014a)
Mixed impacts	JobTIPS (Strickland et al. 2013) Virtual Interview Training for Transition Age Youth (Smith et al. 2021) DEI (Klayman et al. 2019) Linking Learning to Careers (Sevak et al. 2021)	Virtual Reality Job Interview Training (Smith et al. 2015)	Assistive Technology (Butterworth et al. 2020) Job Coaching Academy (Gilson et al. 2021) Project SEARCH ASD (Schall et al. 2020a) Project SEARCH ASD (Wehman et al. 2017)
Negative impacts	None	None	None
No impact	Way2Work (Mann et al., 2021)	None	Project SEARCH ASD (Wehman et al. 2020)

Notes: See Appendix Exhibit C.2 for full details on the evidence assessment rating for each study. All of these studies are RCTs except for Gilson et al. (2021), a QED. In addition, the classification of the impacts' direction only pertains to the employment outcomes listed in Exhibit C.1. For example, if all of the employment outcomes are positive (or negative), then the study would be categorized as a positive (or negative) impact. In contrast, if some employment outcomes were positive and others were insignificant, this would be categorized as a mixed impact.

ASD = autism spectrum disorder; QED = quasi-experimental design; RCT = randomized controlled trial.

The following are key findings from studies assessed as having a high evidence rating:

- Virtual job interview training positively impacted mock job interview quality (Smith et al. 2014, 2021; Strickland et al. 2013) and achieving CIE at the six-month follow-up (Smith et al. 2021).
- Vermont’s Linking Learning to Careers, an enhanced services model that expanded vocational rehabilitation services for transition-age youth, had no impact on earnings across all participants within 24 months of program enrolment (Sevak et al. 2021).
- Way2Work Maryland, an enhanced services model that expanded vocational rehabilitation services for transition-age youth, had no impact on employment outcomes 24 months after enrollment (Mann et al. 2021).
- Disability Employment Initiative, which provided training and support services across systems to improve job placement, negatively impacted youth outcomes and did not impact adult employment outcomes (Klayman et al. 2019).

## E. Conclusion

This systematic evidence review examined literature that documented interventions and strategies that help people working in subminimum wage employment—or considering doing so—succeed in CIE. In this report, experimental study results documented impacts, and descriptive studies presented promising practices for employment outcomes at all intervention levels: person, employer, and system levels. In addition, this systematic evidence review identified gaps in the literature, including the lack of rigorous evidence with a clear causal link between the intervention and its impacts. Moreover, none of the experimental studies examined programs that focused on populations that are typically underserved. These findings underscore a need for more programs and evaluations involving adults and traditionally underserved populations, such as racial and ethnic minorities, those living in underserved areas, and people with complex or multiple disabilities.

As policy priorities shift to end subminimum wage employment and promote CIE, the field would benefit from more evidence about interventions and strategies to meet these policy goals among people with disabilities. Of crucial importance, policymakers and practitioners might need more information to understand practical lessons to replicate, evaluate, and scale promising interventions. The SWTCIE demonstration provides opportunities to add to the evidence base to inform policymakers and practitioners in the field.

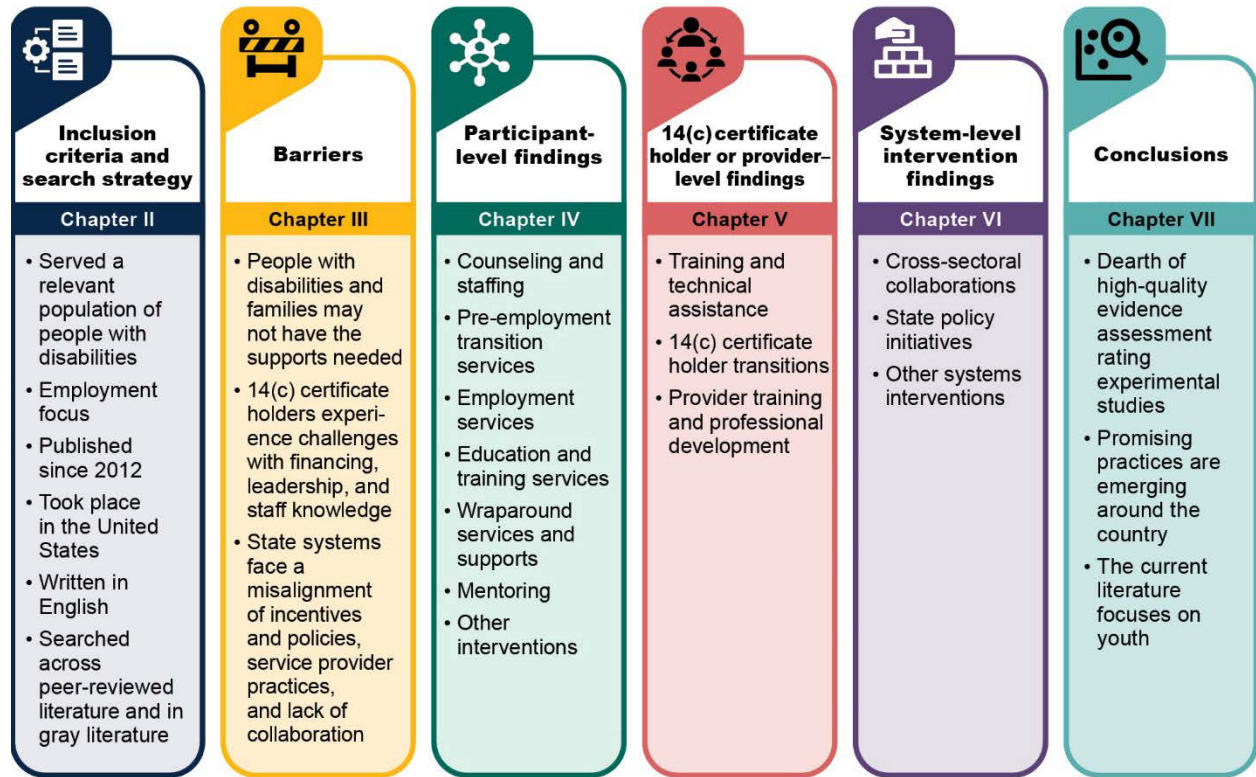
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## I. Introduction

People with disabilities and practitioners who run programs for job seekers with disabilities working in subminimum wage employment (SWE)—or considering doing so—need evidence on the interventions and strategies that can help people succeed in competitive integrated employment (CIE). This systematic evidence review synthesizes the evidence on this topic. We conducted it as part of the national evaluation of the Subminimum Wage to Competitive Integrated Employment (SWTCIE) Innovative Model Demonstration project. The findings will inform the state SWTCIE projects' implementation plans and Mathematica's evaluation design for the SWTCIE demonstration. The review has two goals. First, we identify research about interventions (for example, programs, services, supports, and strategies) that encourage CIE for people with disabilities. Second, we document what is known about the effectiveness of such interventions. Results from the evidence review will offer practitioners, policymakers, and other interested parties with evidence to guide their decision making related to this topic.

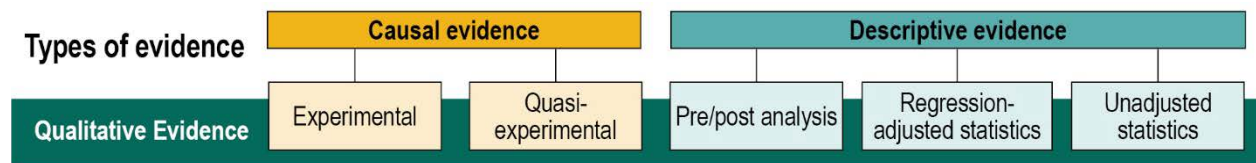
Exhibit I.1 presents a road map for this report. Chapter I summarizes the evidence review and the research questions we investigated. Chapter II presents our approach for identifying relevant research. Chapter III discusses the barriers faced by people with disabilities, 14(c) certificate holders, and state service systems as they shift from SWE to CIE. Chapters IV through VI describe the policy-relevant programs, interventions, and strategies identified in this evidence review for the three different entities involved in CIE. Many of the articles identified in the systematic evidence review cut across the topics of Chapters IV through VI. To limit redundancy, we generally feature the articles in a single chapter based on the differentiating or main feature of the intervention. Chapter IV focuses on strategies for people with disabilities working in or considering SWE. Chapter V reviews the literature on service providers (who might or might not hold a 14(c) certificate) transitioning away from SWE or offering CIE. Chapter VI centers on interventions that operate at the system-level across individuals, providers, and state and local service systems. For this review, we consider service providers separately from other system-level interventions, which might include building cross sectoral partnerships across government agencies and non-14(c) certificate employers. Chapter VII concludes the report with high level summative findings from the systematic evidence review.

**Exhibit I.1. Road map of report chapters**



To systematically evaluate and summarize the evidence of interventions’ effectiveness, we adapted the approach described in the “Pathways to Work Evidence Clearinghouse Guide for Researchers” (Shiferaw et al. 2022) and the American Psychological Association (APA) “Qualitative Design Reporting Standards” (2020). Although the Pathways approach has a broader focus (that is, the study quality rating), similar methods can identify eligible studies relevant to the SWTCIE demonstration and consider the strength of evidence for specific interventions. The scope of our systematic evidence review encompasses causal and descriptive evidence that informs what we know about what works to promote CIE among people with disabilities (Exhibit I.2).

**Exhibit I.2. Evidence on strategies to promote CIE**



Recent studies have identified promising interventions to help people with disabilities transition to CIE. These interventions include a person-centered job placement approach, benefits counseling (Advisory Committee on Increasing Competitive Integrated Employment for Individuals with Disabilities 2016), technology and technical assistance (TA) to enhance productivity (Shenk et al. 2021), mentorship for employees, customized employment strategies, and additional state and federal resources that promote



CIE (Curda 2021). Many of these interventions are described in [toolkits](#) to help providers transform their service delivery models to support CIE (U.S. Department of Labor [DOL] 2018).

## A. Research questions

We posed 12 research questions to uncover barriers to CIE as well as identify the policy-relevant programs, interventions, and strategies that promote CIE at the person-level, 14(c) certificate holder or provider-level, and system-level (Exhibit I.3).

**Exhibit I.3. Research questions for the systematic evidence review**

Level	Research questions
Barriers to CIE	<ol style="list-style-type: none"> <li>1. What common barriers do people with disabilities working in or considering SWE face when seeking CIE?</li> <li>2. What common barriers do 14(c) certificate holders face when transforming their service models to promote CIE and transitioning from SWE?</li> <li>3. What common barriers do state service systems experience when ending SWE?</li> </ol>
Person-level	<ol style="list-style-type: none"> <li>4. What policy-relevant programs, interventions, and strategies have been documented to encourage CIE among people with disabilities working in or considering SWE?</li> <li>5. What research exists on the effectiveness of policy-relevant programs, services, and strategies to encourage CIE among people with disabilities working in or considering SWE?</li> <li>6. What common barriers do people with disabilities working in or considering SWE face when seeking CIE?</li> </ol>
14(c) certificate holder or provider-level	<ol style="list-style-type: none"> <li>7. What policy-relevant programs, interventions, and strategies have been documented to help 14(c) certificate holders and service providers successfully transform their service models to promote CIE or transition from SWE?</li> <li>8. What research exists on the effectiveness of policy-relevant programs, interventions, and strategies for 14(c) certificate holders and service providers to successfully transform their service models in promoting CIE or transitioning from SWE?</li> <li>9. What common barriers do 14(c) certificate holders or service providers face when transforming their service models to promote CIE or transitioning from SWE?</li> </ol>
System-level	<ol style="list-style-type: none"> <li>10. What policy-relevant programs, interventions, and strategies have been documented to encourage CIE or end SWE at the system-level?</li> <li>11. What research exists on the effectiveness of policy-relevant programs, interventions, and strategies to encourage CIE or end SWE at the system-level?</li> <li>12. What common barriers do state service systems experience when promoting CIE or ending SWE?</li> </ol>

CIE = competitive integrated employment; SWE = subminimum wage employment.

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## II. Inclusion Criteria and Search Strategy

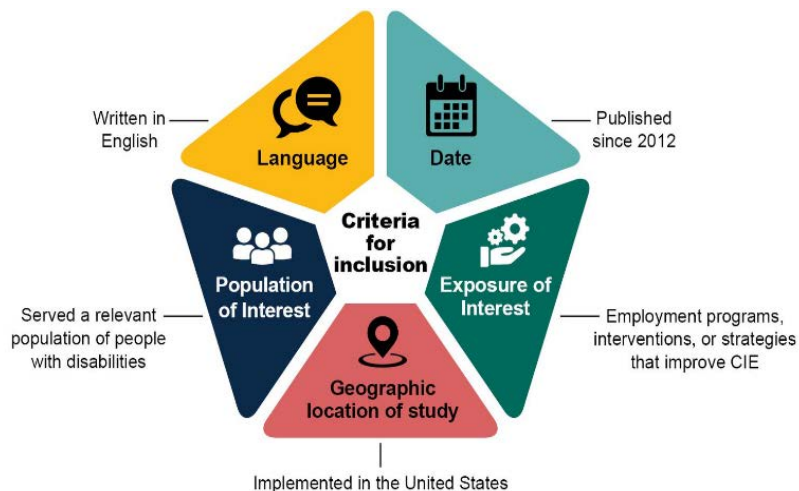
This chapter summarizes the criteria used to identify the relevant literature review of interventions and strategies that can help people with disabilities succeed in CIE. We also describe our strategy to search for eligible publications included in this systematic evidence review.

### A. Inclusion criteria



To ground the scope of the evidence review, we developed criteria specifying the population and entities of interest, relevant interventions, employment focus, timing, and setting. We used the following criteria to determine studies eligible to include in the systematic review (Exhibit II.1):

**Exhibit II.1. Inclusion criteria for the systematic evidence review**



CIE = competitive integrated employment.

- **Population of interest: Serves a relevant population, including working-age people older than 16 with disabilities.** When specifying the population of people with disabilities, we intentionally focused on subgroups that tend to work in or consider SWE, such as people with intellectual or developmental disabilities, people with acquired brain injury, and people on the autism spectrum. We excluded people with chronic conditions (which include cardiovascular conditions, cancers, and diabetes); cognitive disabilities including those who have experienced a stroke, Alzheimer's disease, and other dementias; and severe mental illness because these individuals have distinct support needs.
- **Employment focus: Describes employment programs, interventions, and strategies to promote CIE, customized employment (CE), or supported employment (SE) or mitigate barriers to achieving CIE, CE, or SE.** The interventions must have supported current or prospective workers with hard or soft skills and addressed common barriers to employment with a stated goal of supporting employment. The programs must also have been implemented and enrolled at least one person with a disability; we did not include studies suggesting strategies for future or hypothetical programs.

- **Timing: Focus on studies released since 2012.** Advocacy, policy, and practice have evolved in recent years to promote CIE. Focusing our evidence review on more recent studies strengthens the relevance of our findings.
- **Setting: Implemented in the United States and written in English.** We limited the review to studies on U.S.-based employment programs to ensure they are relevant to the unique policy context of the SWTCIE project.

## B. Search strategy

We applied search terms to identify peer-reviewed literature for review through electronic research databases. Using a defined Google search, we also reviewed gray literature and organizational websites to identify relevant research. We leveraged evidence from clearinghouses and key existing literature reviews, including the Pathways to Work Evidence Clearinghouse, Government Accountability Office (GAO) Subminimum Wage Program: Factors Influencing the Transition of Individuals with Disabilities to Competitive Integrated Employment, Research Support Services for Employment of Young Adults on the Autism Spectrum literature review, Clearinghouse for Labor Evaluation and Research, and Virginia Commonwealth University's Rehabilitation Research and Training Center on Employment of Persons with Intellectual and Developmental Disabilities (I/DD) evidence reviews. In addition, we considered relevant sources cited in the SWTCIE projects' grant applications that met our inclusion criteria.

We identified 484 studies from the search of electronic research databases. Of these, 42 met the inclusion criteria. We identified an additional five publications that met the inclusion criteria from gray literature and organizational websites, 20 from clearinghouses and key existing literature reviews, and eight from the grant applications. Together, 72 publications met the inclusion criteria and appear in this review. Exhibit II.2 presents the number of eligible studies from each search included in the review.

**Exhibit II.2. Count of studies that did meet inclusion criteria**

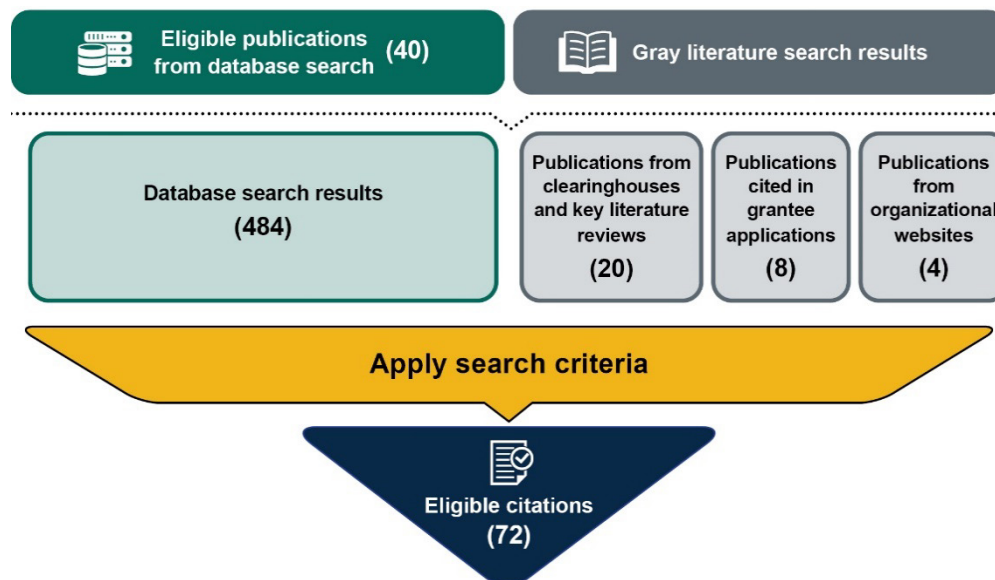
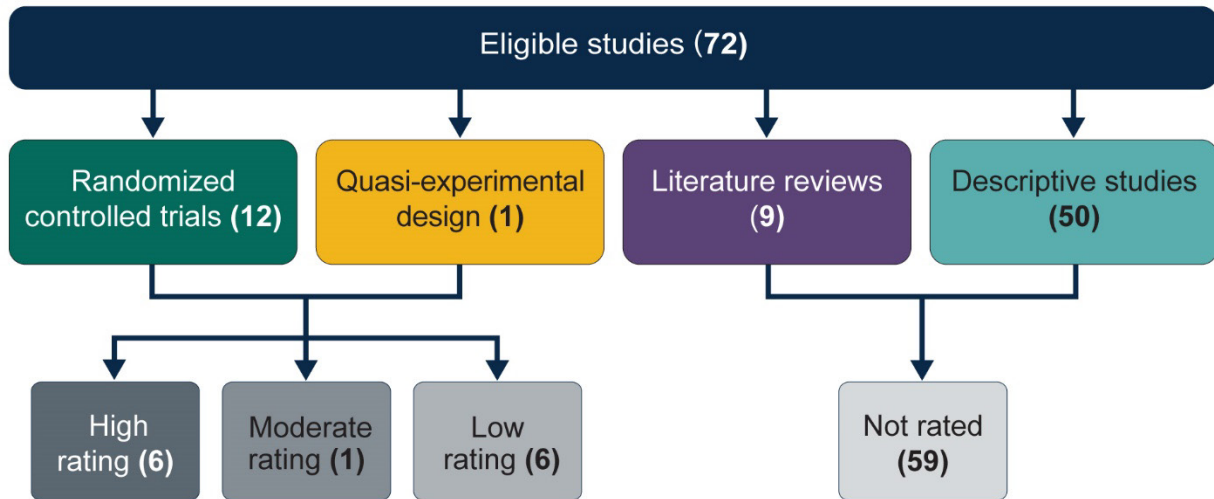


Exhibit II.3 outlines the number of eligible studies we categorized into the following groups: randomized controlled trial (RCT), quasi-experimental design (QED), literature review, and descriptive study.<sup>1</sup> We assigned categorical study quality ratings to the RCTs and QEDs to compare the strength of evidence across these studies (Exhibit II.4). We leveraged the Pathways Clearinghouse process for reviewing RCTs and comparison-group QEDs (depicted in Exhibits II.5 and II.6) and the APA “Qualitative Design Reporting Standards” when applying our study quality ratings. We did not assign ratings for the descriptive studies included in the evidence review.


**Exhibit II.3. Count of studies by design and study rating**



**Exhibit II.4. Quality ratings applied to RCT and QED studies**

Icon to signify rating throughout the report	Rating	Interpretation
	High	There is strong evidence that the findings are solely attributable to the intervention examined.
	Moderate	There is some evidence that the findings are attributable, at least in part, to the intervention examined. Other factors not accounted for in the study might also have contributed to the findings.

<sup>1</sup> RCTs can produce the strongest possible evidence because the random assignment can ensure there are no systematic differences between the intervention and comparison groups at the start of the intervention. Comparison-group QEDs can also produce strong causal evidence, but, by design, they are likely to produce weaker evidence than an RCT because the intervention group chose to use services and the comparison group did not have the choice of using services. For this reason, factors other than the intervention can lead to differences in outcomes. High quality RCTs and QEDs produce causal evidence, and descriptive studies generate correlational evidence.

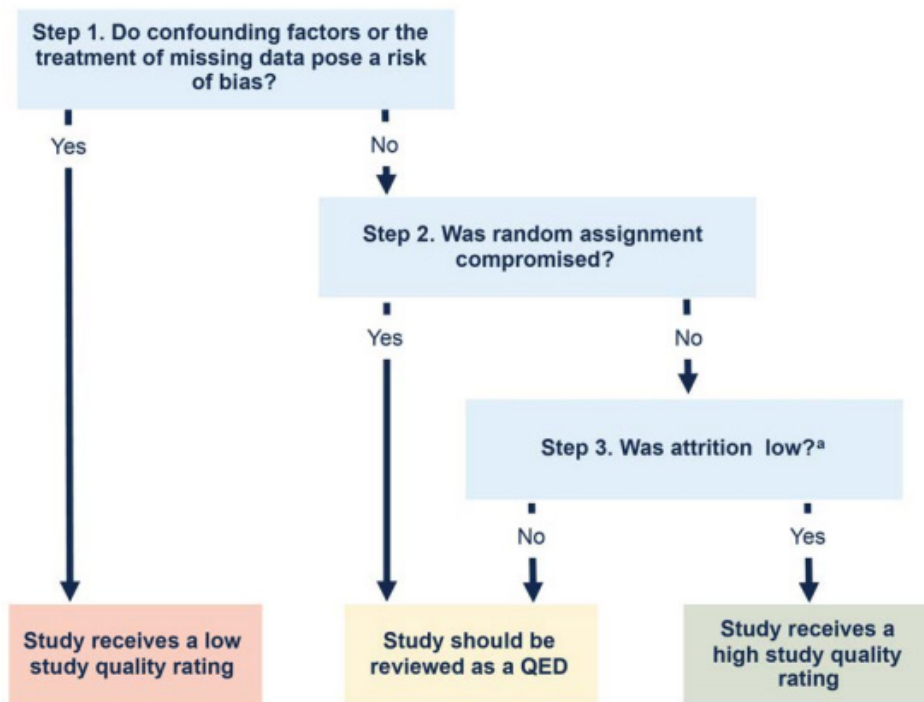
Icon to signify rating throughout the report	Rating	Interpretation
	Low	There is little evidence that the findings are attributable, in part or as a whole, to the intervention examined.

Source: Rotz et al. (2020).

Note: The study quality ratings are assigned to the RCT and QED findings using the methodology defined by Pathways to Work Evidence Clearinghouse (Shiferaw et al. 2022). According to this framework, QED studies can be assigned a moderate or low rating, and RCTs can be assigned a high, moderate, or low rating.

QED = quasi-experimental design; RCT = randomized controlled trial.

### Exhibit II.5. Process for reviewing RCTs



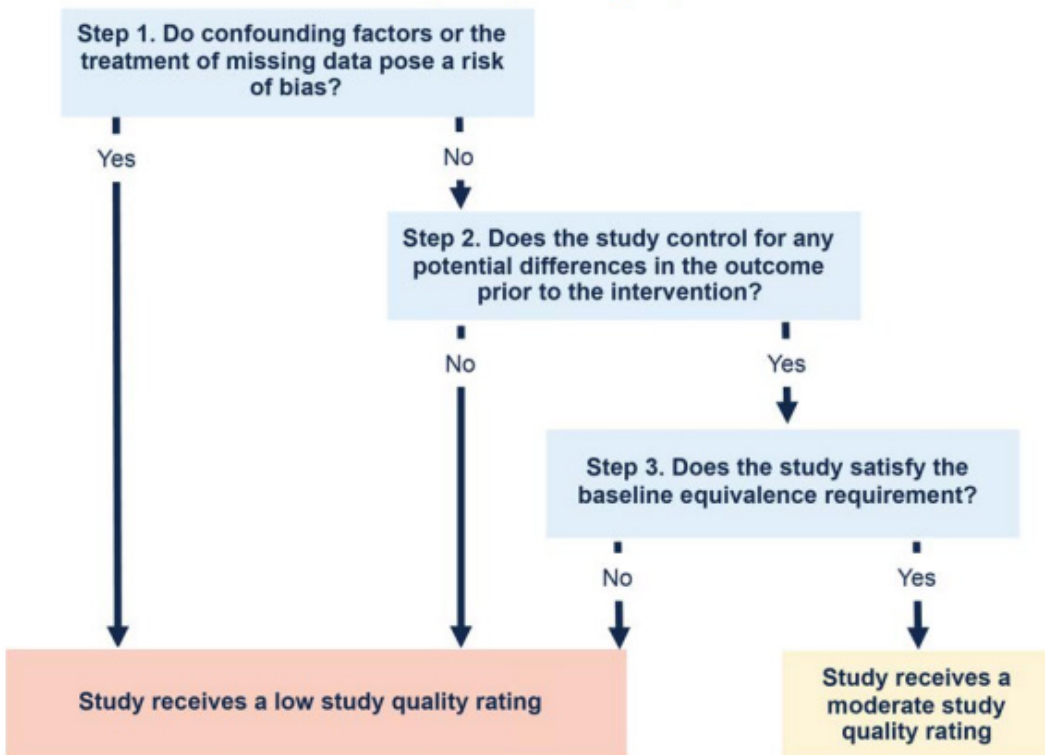
<sup>a</sup>Based on both differential and overall attrition.

Source: Rotz et al. (2020).

Note: See Appendix Exhibit C.2 for full details of the evidence ratings and reasoning for each rating based on the Pathways Clearinghouse criteria.

QED = quasi-experimental design; RCT = randomized controlled trial.

**Exhibit II.6. Process for reviewing comparison-group QEDs**



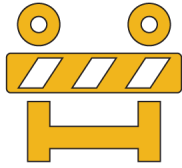
Source: Rotz et al. (2020).

Note: See Appendix Exhibit C.2 for full details of the evidence ratings and reasoning for each rating based on the Pathways Clearinghouse criteria.

QED = quasi-experimental design; RCT = randomized controlled trial.

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### III. Barriers to Achieving CIE



People with disabilities encounter a myriad of barriers to achieving CIE that are well documented in the literature. Many strategies purport to overcome those barriers, yet the continued use of SWE and poor employment outcomes for people with disabilities underscore the difficulties in surmounting these barriers. For example, people with I/DD have experienced limited increases in the use of integrated employment services from 1988 to 2018, and recent trends show a decrease in CIE outcomes for this population upon exiting from vocational rehabilitation (VR) agency programs (Winsor et al. 2021). In this chapter, we discuss the barriers that people with disabilities and their families encounter as they seek CIE, 14(c) certificate holders face as they transform their service models, and state service systems confront as they end SWE (Exhibit III.1). Each of the grant applications for the SWTCIE projects cited one or more of these barriers. However, they often focused on those related to people with disabilities and their families. The interventions that projects will offer as part of their models aim to address one or more of these barriers. These systemic, attitudinal, and other barriers are not distinct within each column; they often intersect and interconnect. Low expectations—mentioned in the applications of six SWTCIE projects—affect people with disabilities, their families, staff from 14(c) certificate holders and service providers, and employers. The sources used in this chapter draw from those identified in the systematic evidence review as well as other references that highlight and seek to address barriers to employing people with disabilities.

**Exhibit III.1. Barriers to CIE faced by people with disabilities and their families, 14(c) certificate holders, and state service systems**



CIE = competitive integrated employment.



#### A. What common barriers do people with disabilities working in or considering SWE face when seeking CIE?

People with disabilities and their families may face multiple barriers to leaving SWE and attaining CIE. We categorize these barriers into five overarching types: personal factors, disability benefits, transportation, employer barriers, and family factors.

**Personal factors.** Several factors may encourage people with disabilities to choose SWE over CIE:

- **Support needs.** People with I/DD who have significant support needs are more likely to be involved in facility-based activities and less likely to have community-based employment (Houseworth et al. 2022). Facility-based employment, relative to CIE, may be perceived as minimizing the risk to personal physical or psychological safety for people with disabilities, offering the comfort of long-term placement (such as consistent scheduling and employment stability), and having regular work hours. Families may also fear their children being taken advantage of in the workplace (Carter et al. 2023). SWE opportunities may also be perceived to have simpler or less demanding tasks than CIE. People currently working in or considering SWE may not be able to access or maintain the intensive supports that they need for CIE either because they do not know about them or providers do not offer them (Brooke et al. 2018; Inge et al. 2009).
- **Education and work experience.** Education and work experiences—a person’s prior work and training—can limit opportunities for CIE, which is why six SWTCIE projects identified this as a barrier they will address. The importance of education and work experience is clear: among high school students with severe disabilities, for example, as discussed in Chapter IV of this report, those with paid work experiences in high school had a higher likelihood of working two years after leaving high school (Carter et al. 2012), and youth with autism who have higher educational attainment are more likely to have CIE (Kaya et al. 2018). When people with I/DD work, their employment typically involves lower wages, part-time hours, and few employer-provided benefits (Winsor et al. 2021). For people with I/DD who receive Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI), about 40 percent had never worked before, slightly more than one-third had not completed high school, and half of those employed had wages below minimum wage (Livermore et al. 2017).
- **Social networks.** Social networks may affect SWE in two ways. First, people working in SWE may prefer the friendships that they develop within SWE facilities and do not want to leave their friends behind (Migliore et al. 2008; Curda 2021). Second, people with I/DD and their families may have limited social networks, which people use not only for social connections, but to find jobs (Carter et al. 2023; Spencer et al. 2021).
- **Disparities by race and ethnicity.** The use of specific services, including day habilitation services and supported employment, may differ by race and ethnicity, underscoring disparities in who uses these services (Houseworth et al. 2022).

**Disability benefits.** The low pay that people receive through SWE ensures that they maintain their disability benefits, such as SSI and SSDI. People with disabilities and their families may fear losing these types of benefits if they have higher earnings (Denny-Brown et al. 2013; Curda 2021). This barrier was the most often cited in SWTCIE project applications: 11 projects mentioned this barrier.

**Transportation.** Transportation, mentioned by three SWTCIE projects, presents unique issues for the population most likely to work in SWE (Bross et al. 2023). Few people with I/DD drive, thus creating a reliance on parents, other family members, or public transportation systems, which can be limited in rural areas for transportation to and from work. Moreover, people with I/DD may not have access to training to use public transportation, and discussions and actions on transportation policy at the state and local levels may not consider the needs of people with I/DD.



**Employer barriers.** People with I/DD and their families frequently mentioned barriers related to employers when asked why they preferred facility-based employment or in discussing concerns related to employment (Carter et al. 2023; Migliore et al. 2008). In addition, employers may also not have sufficient knowledge in how to support their employees with disabilities (Kim 2022). Five SWTCIE projects cited these types of employer barriers, reflecting their importance. Moreover, providers, as evidenced by Medicaid spending and family reports of their interactions, may encourage or prioritize options other than SWE for people with I/DD, limiting the choices that people have (Friedman and Rizzolo 2017; Migliore et al. 2008).

**Family factors.** Because of their in-depth knowledge of their youth and related service experiences, family members of people with I/DD may face unique barriers with CIE. Families may encounter difficulties in meeting the expectations of provider staff or with staff expectations for a person with I/DD that run counter to their own (Kramer et al. 2020). They may also be resistant to allowing their child to consider and pursue CIE options or have low expectations for their child’s employment (Carter et al. 2023; Curda 2021). Their perspective is important given that family expectations around their child’s employment are strongly associated with employment outcomes two years after their child leaves high school (Carter et al. 2012). Family members may also have limited knowledge on where to turn for services (Carter et al. 2023). An overarching consideration with family barriers is that parents—as with their children—are not a monolith: each is unique, with different experiences, barriers, concerns, and hopes (Carter et al. 2023).



### B. What common barriers do 14(c) certificate holders face when transforming their service models to promote CIE and transitioning from SWE?

The barriers that 14(c) certificate holders face with transitioning toward CIE and away from SWE revolve around three issues: financing; leadership; and staff attitudes, knowledge, and skills.

**Financing.** Winsor et al. (2021) cite an unpublished report from the Office of Disability Employment Policy that identifies key challenges to transitions from SWE to CIE involving finances and resources. Financing barriers primarily reflect finding resources to support the organization as it moves from one business model to another (Lyons et al. 2018; Rosenthal et al. 2012). That movement can be difficult when the organization primarily relies on SWE. Another financial issue is determining who pays for the services used by people with I/DD as part of their employment; having multiple entities involved may result in confusion about who provides and pays for specific services (Rosenthal et al. 2012). Four SWTCIE projects identified employers’ dependence on SWE and resistance to changing their business models as a barrier.

**Leadership.** Organizations moving from SWE may encounter obstacles as a result of not pursuing sufficient planning as they change their service models, not providing steady leadership to guide the organization’s movement, or not communicating fully to staff on the expected goals and changes (Kamau and Timmons 2018; Lyons et al. 2022; Timmons et al. 2019; Curda 2021). The latter item may be salient for changing staff members’ philosophies on services and employment (Lyons et al. 2018).

**Staff attitudes, knowledge, and skills.** Staff may not receive adequate training as their organizations shift to a model focused on CIE (Lyons et al. 2018, 2022). Staff may believe that facility-based employment is a necessary steppingstone to prepare people with disabilities for CIE or that people with certain types of disabilities are unemployable (Inge et al. 2009), beliefs that are not supported in the

literature (Taylor et al. 2023). Training, such as on evidence-based employment practices and working with community employers, can promote skills needed for organizational transformation and alleviate associated fears (Curda 2021). Many SWTCIE projects identified barriers related to employer attitudes and staff training and knowledge as part of their applications.



### C. What common barriers do state service systems experience when ending SWE?

The barriers to promote CIE and end SWE with state service systems—that is, the organizations offering services to people with I/DD—fall into three categories: the misalignment of policies and payment structures that promote CIE, service provider capacities and practices, and the lack of collaboration across agencies and organizations that offer supports to people with I/DD.

**Misalignment of policies and payment structures.** Policies and payment structures at the state and federal levels for service providers may not promote or incentivize CIE directly or as much as CIE alternatives. This misalignment often results in fewer people with disabilities choosing CIE. For example, Medicaid’s fee-for-service models encourage providers to offer services rather than achieve specific outcomes (such as CIE) that could result in less service use (Denny-Brown et al. 2013; Curda 2021). Thus, more than \$4 of every \$10 (44 percent) in Medicaid Title XIX Waiver funds spent by state I/DD agencies reflect non-work expenditures, relative to roughly \$1 of every \$10 (11 percent) spent on integrated employment services (Winsor et al. 2021). Moreover, supported employment through Medicaid home and community-based services varies widely across states in terms of use, spending, and service rates (Friedman and Rizzolo 2017), underscoring differences in access for people with disabilities based on geographic location. Further, reimbursement rates for intensive services that people with significant disabilities may need to sustain employment may be too low for service providers to offer (Denny-Brown et al. 2013). Finally, the providers or funding that people with disabilities use for services may conflict in terms of goals and outcomes. If a person uses VR services, for example, organizations may not agree on which organization should pay for specific support services necessary for maintaining employment (Rosenthal et al. 2012).

**Service provider capacities and practices.** Service providers and their staff may face obstacles in promoting CIE for people working in or considering SWE.

- **Knowledge.** Service provider staff may have limited knowledge of delivering services that are grounded in best practices around CIE (such as supported employment) and could benefit from additional training (Wehman et al. 2018). Transition staff at schools and VR agencies may not understand the value or impact of CIE or the detrimental effects of SWE (Taylor et al. 2023). The lack of knowledge could result in ineffective or insufficient service provision, thereby reducing the quality of services people use (Molfenter et al. 2017; Wallace et al. 2023). Employment specialists, for example, may not use evidence-based practices or do so inconsistently (Migliore et al. 2012); the use of supported and customized employment services—which are evidence-based practices—by customers exiting from VR agency services is relatively low (Iwanaga et al. 2021; Kim 2022).

- **Employment attitudes.** Families, in discussing their experiences with service providers, mention concerns with staff views of employment for people with disabilities (Kramer et al. 2020). For example, services that a staff member offers to a person with a disability may not reflect the person’s goals and interests for employment. In addition, some staff have views of employment that do not reflect the current emphasis on CIE, resulting in services that exclude employment as an option for people with disabilities.
- **Capacity.** Service providers may not have sufficient capacity to offer services to everyone who could benefit from them. Service providers may also experience high staff turnover, thereby limiting the continuity of care, or have few resources to offer services to people who are English language learners (Jones-Parkin et al. 2021; Kramer et al. 2020). A specific capacity gap may be school-to-work transitions, which five SWTCIE projects raised as a potential barrier.
- **Oversight.** Agencies or systems that conduct oversight of service providers may not have a clear definition or vision of the services to be offered to achieve CIE or a systematic way to ensure that offered services are high quality (Wallace et al. 2023).

**Lack of collaboration.** A third and final category mentioned in both the literature and SWTCIE project applications as a potential barrier to promoting CIE for state service systems is the lack of collaboration across agencies and organizations involved in SWE and CIE. Across the lifespan, people with I/DD access services and supports from several service systems. Yet, service providers, state agencies, and other organizations lack a “unified vision of services” that could lead to improved service connections, divergence from SWE, and emphases on CIE (Winsor et al. 2021). These entities could benefit from intentional collaborations, partnerships, and interagency communications that improve knowledge of best practices and the service landscape (Butterworth et al. 2017; Raynor et al. 2017; Rosenthal et al. 2012). On a more immediate level, service provider staff may not participate consistently in school-based transition planning for students with disabilities, limiting their connections to organizations once those students leave high school (Rosenthal et al. 2012). Four SWTCIE projects listed collaboration as a potential barrier, and all projects will promote collaboration through investing in communities of practice.

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## IV. Person-Level Intervention Findings



Person-level interventions focus on services and interventions to encourage CIE for people with disabilities. Most interventions have multiple components, and determining which lever impacted participants can be challenging. We categorized studies by considering which feature drove the intervention or differentiated it from other studies. We present salient themes and study findings about service innovations in this chapter because helping people is at the heart of these interventions aiming to support

individuals to find meaningful CIE.

Of the 38 sources examining person-level interventions included in this systematic review, we identified four RCTs assessing the effectiveness of virtual job interview training programs (Virtual Reality Job Interview Training, Virtual Interview Training for Transition Age Youth, and JobTIPS) and two RCTs assessing the effectiveness of enhanced services models that expanded VR services for transition-age youth to improve employment outcomes. The small number of RCT studies indicates there is scarce evidence about rigorous interventions geared to support people with I/DD preparing for and securing CIE. One such literature review notes that few experimental studies involve people with I/DD; of those, almost all examine programs for transition-age youth with I/DD. Even less evidence exists on what works to support adults with I/DD seeking CIE (Qian et al. 2018). Exhibit IV.1 summarizes key findings from experimental studies by evidence rating, and Exhibit IV.2 summarizes lessons learned identified by descriptive studies with person-level intervention components.

**Exhibit IV.1. Key findings of experimental studies on person-level interventions, by evidence rating**

Intervention (authors and year)	Sample size	Outcome measures	Direction
<b>High evidence rating RCTs</b>			
JobTIPS (Strickland et al. 2013): Job interview training provided virtually.	Treatment group: n = 11 Control group: n = 11	Content score for a mock job interview	+***
		Delivery skills score for mock job interview delivery skills	+*
		Social responsiveness scale for youth	NS
Vermont's Linking Learning to Careers (Sevak et al. 2021): Enhanced services model which expanded VR services for transition-age youth.	Treatment group: n = 413 Control group: n = 390	Had at least one quarter of earnings within 24 months of program enrollment (all)	NS
		Had at least one quarter of earnings within 24 months of program enrollment (early cohort)	NS
		Had at least one quarter of earnings within 24 months of program enrollment (late cohort)	+**
Virtual Reality Job Interview Training (Smith et al. 2014): Job interview training provided virtually.	Treatment group: n = 16 Control group: n = 10	Overall performance for job interview role-play	+**
		Job relevant interview content	+*
		Interviewee performance	+*
		Job interview self-confidence rating	+*
Virtual Interview Training for Transition Age Youth (Smith et al. 2021): Job interview training provided virtually.	Treatment group: n = 48 Control group: n = 23	Achieved competitive integrated employment at six-month follow-up	+***
		Number of interviews attended by the six-month follow-up	NS
		Achieved any employment type	NS

Intervention (authors and year)	Sample size	Outcome measures	Direction
		Likeliness to be hired (global rating)	+***
		Mock interview total score	+***
		Job interview self-efficacy	NS
		Job interview anxiety	+**
Way2Work Maryland (Mann et al. 2021): Enhanced services model that expanded VR services for transition-age youth.	Treatment group: n = 200 Control group: n = 201	<u>Employment outcomes 24 months after enrollment:</u>	
		Worked in paid employment in the past year	NS
		Enrolled in postsecondary education or working at the time of the interview	NS
		Worked at any job (paid or unpaid) in the past year	NS
		Worked at the time of the interview in a paid job	NS
		Worked at the time of the interview in an unpaid job	NS
		Number of jobs in the past year	NS
<b>Moderate evidence rating RCTs</b>			
Virtual Reality Job Interview Training (Smith et al. 2015a): Provides job interview training virtually.	Treatment group: n = 16 Control group: n = 10	<u>Six-month follow-up between-group differences:</u>	
		Weeks looking for a position (job or volunteer)	NS
		Interviews completed (job or volunteer)	NS
		Completed an interview (job or volunteer)	NS
		Received an offer (job or volunteer)	NS
		Accepted a position (job or volunteer)	+*
		Post-training self-confidence	NS
		Prior paid employment	NS
		Attaining competitive employment	+**

Note: Asterisks in the direction column indicate the statistical significance: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . High study evidence ratings indicate there is strong evidence that the findings are solely attributable to the intervention examined. Moderate evidence ratings indicate there is some evidence that the findings are attributable, at least in part, to the intervention examined. Other factors not accounted for in the study might also have contributed to the findings. Low evidence ratings indicate there is little evidence that the findings are attributable, in part or as a whole, to the intervention examined (Rotz et al. 2020). See [Appendix Exhibit C.2](#) for full details of the evidence ratings and reasoning for each rating based on the Pathways Clearinghouse criteria.

CIE = competitive integrated employment; NS = not significant; RCT = randomized controlled trials.

## Exhibit IV.2. Lessons learned identified in the descriptive studies on person-level interventions

### Lessons learned

- **Patterns in VR service use** indicate job-related VR services and personal characteristics, such as being male, are associated with improved employment outcomes.
- **Counseling** to assess the person's skills, interests, and employment goals is the first step for many employment interventions identified in the systematic evidence review to help individuals with disabilities prepare for or secure CIE, such as SourceAmerica's Pathways to Careers®.
- **Paid work experiences in high school** are associated with employment after graduation.
- **Job task and job-related skills training** delivered through a collegiate postsecondary education program is associated with community employment.
- **Self-determination curricula** have mixed effects on employment outcomes.
- **SE or CE** is associated with attaining employment.
- **Handheld technology** can provide job coaching and task reminders to support people with disabilities to perform their job duties as well as improve vocational skills.








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CE = customized employment; CIE = competitive integrated employment; SE = supported employment; VR = vocational rehabilitation.

### A. What interventions have been documented to encourage CIE among people with disabilities working in or considering SWE?

To successfully transition from SWE to CIE, people with disabilities might benefit from services or supports that build their skills, increase their job readiness, and inform them about the impacts paid employment could have on the benefits they receive. People with disabilities might also benefit from wraparound supports and services that can be customized based on their support needs, employment and other goals, and personal circumstances. We have organized these interventions into seven categories and describe the evidence base for each in the remainder of this chapter: counseling and staffing, pre-ETS, employment services, education and training services, wraparound services and supports, mentoring, and other individual interventions (Exhibit IV.3).

**Exhibit IV.3. Seven categories of participant-level interventions that promote CIE**

 Counseling & Staffing	 Pre-ETS	 Employment Services	 Education & Training Services	 Wraparound Services & Supports	 Mentoring	 Other Participant Interventions
Counseling services and assessments of a job seeker's skills, interests, and goals	VR services such as work-based learning, work-readiness training, and self-advocacy training for students with disabilities	Career exploration, job search assistance, job coaching and supports, supported and customized employment services	Vocational skills training; work-based learning experiences such as postsecondary education, apprenticeships and internships; and other education and training services	Assistive technology, benefits counseling, information and referrals to services, transportation, and personal assistance	Peer and family mentoring	Other services beyond usual VR services

Source: SWTCIE grant applications.

Pre-ETS = pre-employment transition services; VR = vocational rehabilitation.



### 1. Counseling and staffing

**Counseling to assess the person’s skills, interests, and goals is the first step for many employment interventions designed to help people with disabilities prepare for or secure CIE.** For example, providers in SourceAmerica’s Pathways to Careers® (Pathways) talk with the individual and family, observe the individual in a variety of settings, and then develop a career plan to identify a customized paid internship or job match as part of customized employment services model (Sevak et al. 2019).<sup>2</sup> **Among adults, job coaching and mentorship using a systematic individualized approach supports achieving CIE (Qian et al. 2018).** Respondents identified individualized assessments and person-centered planning as key facilitators that promote CIE among transition-age youth with disabilities in focus groups composed of parents, providers, educators, and employers (Schutz et al. 2023). As noted in Chapter VI, many system-level interventions also include counseling and staffing as a first step.

**Promising technology interventions, such as an online service to communicate job preferences and remote audio coaching paired with a mnemonic strategy, support job counseling for people with I/DD.** My JobQuest is a web-based service that helps people with I/DD identify and communicate job preferences (Davies et al. 2018). Individuals view brief videos of people performing jobs and tasks and identify which tasks look interesting to them. The application requires little to no reading or training, and the majority of participants (18 of 20) navigated the application independently with no assistance needed. The job interest assessment results were statistically significant; the prototype effectively enabled people

<sup>2</sup> The employment services section offers more details on this intervention.



with I/DD to note their job interests and dislikes. **The use of this technology could reduce the overall cost and time spent conducting this usually hands-on assessment.** Another intervention uses remote audio coaching and a mnemonic strategy over Zoom to teach employment decision making skills to adults with I/DD at an inclusive postsecondary education program ([Brady et al. 2022](#)). Students learned a mnemonic to help them identify whether the job meets their needs and interests. The pilot study found that **three students assessed the fit of the job opportunities using the questions from the mnemonic when supplemented with remote job coaching.** The students provided multiple, specific reasons for their employment choices after the intervention, in contrast with responses such as “I like it” or “I do not like it” before the intervention. The study notes limitations with generalizing findings because the students all attended the same inclusive postsecondary education program, were familiar with Zoom, and had access to a laptop.



## 2. Pre-employment transition services

Pre-ETS cover a wide range of employment, education, and training services available to students with disabilities enrolled in high school or postsecondary education or training. A valuable component of pre-ETS identified in our search is vocational skills training. **Among students with I/DD, vocational skills training are important predictors of employment** ([Southward and Kyzar 2017](#)).-Vocational skills training includes career assessment, career counseling, prevocational education, pre-vocational training/job readiness training, specific job skills training, instruction in finding jobs, job shadowing, job coaching, internship/apprenticeship, and placement support.

The systematic evidence review identified the following key descriptive findings about pre-ETS:

- Paid work experiences in high school are associated with employment after graduation.
- Job task and job-related skills training delivered through a collegiate postsecondary education program is associated with community employment.
- Self-determination curricula have mixed effects on employment outcomes.

The following sections delve into findings across a variety of pre-ETS models included in the systematic evidence review.

### *a. Job exploration counseling*

Job exploration counseling includes activities that help with career-related issues, such as identifying the individual’s job goals, understanding what job options are available in the market, and learning about nontraditional employment options. Although job exploration counseling is a main component of pre-ETS, the systematic evidence review did not uncover any articles that included it as the primary activity in an intervention or study.

### *b. Workplace readiness training*

Workplace readiness training includes interpersonal and social skills training to prepare people for CIE. **A soft-skills curriculum for individuals with autism spectrum disorder (ASD) called Assistive Soft Skills, and Employment Training found that more than 80 percent of participants reported improved social functioning and at least one soft skill.** This intervention consisted of 90-minute weekly group sessions for eight weeks with young adults with ASD, covering topic areas such as communication,

enthusiasm and attitude, teamwork, networking, problem solving and critical thinking, and professionalism. After completion, 71 percent of participants reported that content on attitude, enthusiasm, and professionalism would assist them in the workplace ([Sung et al. 2019](#)). Because the study did not include real-world employment data, these impacts may not lead to employment outcomes. Five of six studies in a literature review reported positive relationships between vocational skills program participation and postsecondary CIE for students with I/DD. This literature review only included studies that focused on transition-age youth with an I/DD diagnosis, included quantitative findings pertaining to competitive employment after exiting high school, are published in a peer-reviewed journal, were conducted in the United States, and included the findings reported in English (Southward and Kyzar 2017). Another study identified through the same literature review reported that 62 percent of students with I/DD held their current job for three or more years after receiving vocational skills training in high school ([Siperstein et al. 2014](#)). Although the usefulness of these trainings is likely not limited to youth, the articles identified in the systematic evidence review that centered workplace readiness training at the person-level are focused on youth and student populations.

### *c. Work-based learning experiences*

Work-based learning experiences encompass a variety of activities for students, including job shadowing, internships, simulated work, and paid and unpaid work as well as volunteering opportunities. Two literature reviews found that **paid work experiences in high school are associated with employment after graduation** (Qian et al. 2018; Southward and Kyzar 2017). Using nationally representative data on transition-age students receiving special education services, one study found that paid work experiences in high school more than doubled the odds of attaining paid work two years after high school (odds ratio of 2.4; [Carter et al. 2012](#)). Additionally, other studies ([Joshi et al. 2012](#); [Wagner et al. 2014](#); Carter et al. 2012) found that employment after high school among transition-age youth with I/DD is associated with school-sponsored work and other paid employment in high school but is not associated with unpaid work activities. The three studies identified these results among students with severe and mild disabilities, as well as when controlling for personal factors such as social skills and language ability. Further, two other studies identified in the Southward and Kyzar (2017) literature review found that youth with paid employment experience in high school increased the likelihood of employment after high school between four and half times ([Simonsen and Neubert 2013](#)) and five times ([Papay and Bambara 2011](#)).

### *d. Comprehensive transition or postsecondary educational programs*

**Counseling on educational and training options supports students to make a smooth transition from high school to postsecondary education.** Using program data from a collegiate postsecondary education transition program called Crossing Points, **job task and job-related skills training statistically significantly increased the odds of attaining community employment about one and a half times (odds ratio of 1.45).** Additionally, the study found that job-specific skills training more strongly predicted employment attainment compared to global measures of intellectual or adaptive behavior. Crossing Points teaches general life and job-specific skills training to young adults with I/DD through task analyses for several different jobs that have been identified in the community ([Barnard-Brak et al. 2023](#)).

**Summer programs are opportunities to prepare and motivate students with I/DD to seek CIE.** Eighteen transition-age students ages 16 to 21 with I/DD were more likely to be intrinsically motivated and future-focused after attending a six-week summer program led by job coaches ([Myers and Cox 2020](#)). Students' motivation to work broadened from short-term expectations of "getting paid" to a longer-term,

more holistic view of employment that enables students to gain independence, have positive work experiences and enjoy the job and people (Myers and Cox 2020). **At the beginning of the program, 78 percent of students reported they were not ready to look for a job; by program completion, 83 percent said they felt prepared to look for a job.** Most students expected it would be easy to find a job before and after the program. However, job coaches noted that the students would likely need additional support, and student expectations might be unrealistic.

*e. Self-advocacy training*

Self-advocacy training supports a person’s ability to communicate needs and desires to others, and one aspect of it is self-determination training. Students with higher levels of self-determination experienced better employment outcomes one-year post high school and a higher likelihood of obtaining a job with benefits in two studies in the Southward and Kyzar literature review (2017). However, the evidence of self-determination training on positive employment outcomes is mixed. The Qian et al. (2018) literature review identified a study ([Shogren et al. 2015](#)) that found the control group had better employment outcomes than the intervention group one year after self-determination training. Yet after two years, both groups showed decreasing employment levels with smaller decreases in the intervention group. The researchers concluded that the intervention group experienced more employment stability, which could result from the self-determination training (Shogren et al. 2015).



### 3. Employment services

Six studies described employment services and supports to promote CIE in people with ASD and I/DD. SE and CE are key features of multiple articles identified through the systematic evidence review. Other common services identified include job placement and on-the-job support.

*a. Supported and customized employment*

SE and CE services encompass a variety of individualized supports, services, and strategies to help workers with a disability maintain employment. Three studies found that **SE and CE are associated with attaining employment**. One retrospective review of VR records of individuals with ASD found that of the 139 individuals referred to SE and CE services, 104 achieved CIE with a successful VR closure. Over time, the need for employment support declined: at baseline, nearly 60 percent of VR clients sought minimal support (fewer than four hours per month), and at 18 months, 90 percent of clients sought minimal support ([Brooke et al. 2018](#)).

Of young adults with ASD who had limited or no work experience at baseline, **more than three-quarters who received SE services obtained CIE with earnings commensurate with other workers performing the same job** ([Wehman et al. 2012](#)). During this 23-month prospective study, the SE model included an assessment of job-related skills and interests, assistance with job search and development, on-the-job training, and the use of long-term supports to maintain employment. Long-term supports included employment-based supports as well as individual and community-based supports (Wehman et al. 2012). These findings are supported by results from a classification and regression tree analysis that **suggest SE is associated with higher employment rates among young adults with I/DD receiving VR services compared to those who do not receive SE; the successful employment outcome was defined as participants sustaining CIE for 90 days at VR case closure**. Two groups in the study—(1) transition-age youth who were Social Security Administration beneficiaries and who had received special education

in secondary school and (2) young adults with I/DD or ASD who graduated from high school—experienced a 20 percent increase in employment rate after SE, the highest increase among nine subgroups observed in this study. Receiving SE was more likely among Social Security Administration beneficiaries or individuals who had no postsecondary education experience in a propensity score matching analysis to generate matched case-controls ([Wehman et al. 2014](#)).

Using a CE model, the **Pathways demonstration had mixed results in informing individuals with ASD and I/DD about CIE**. Pathways utilized a comprehensive service model that included Discovery, customized internships and paid internships, job supports, training, and continued career support after accepting a job (Sevak et al. 2019). **Compared to matched VR participants, Pathways participants attained similar rates of employment for 90 days or more; however, Pathways participants worked more hours weekly and had higher earnings**. There may be limits to the comparability between Pathways participants and traditional VR clients because the model implemented a zero-exclusion philosophy, which presumes that competitive employment with customized supports is possible for everyone (Sevak et al. 2019).

**A pilot study of SUCCESS, a curriculum that focuses on SE, cognitive enhancement, and social skills, among eight individuals with ASD showed an improvement in their social cognitive and communication skills in the areas of social awareness, social communication, and social motivation with moderate-large effect sizes**. The intervention implementation occurred over six months for a total of 25, one and half hour weekly sessions that focused on cognitive enhancement and social skills. Participants reported high levels of satisfaction with the program. At baseline, two out of the nine participants obtained paid part-time work at six hours per week. At the end of the intervention, five of the participants attained paid work ranging from 10 to 40 hours per week ([Baker-Ericzén et al. 2018](#)).

One study examined the employment outcomes of 64 people with ASD who were referred by the state VR agency and received supported employment services ([Wehman et al. 2016](#)). Most (71 percent) were reported to have high social interaction support needs, defined as requiring a one-to-one personal support aide at the time of high school graduation, significant behavioral and social communication challenges, or intermittent work histories where VR counselors reported that loss of employment was the result of limited social skills (or some combination of these needs). **All individuals who received supported employment services from 2009 to 2014 successfully secured CIE, maintained their employment with ongoing supports, and decreased their need for employment specialist support over time**. The majority (63 of 64 people, or 98 percent) secured CIE through a combination of SE and CE services. Most (77 percent) indicated that they had never worked before, and an additional 18 percent reported having short intermittent histories of employment.



#### 4. Education and training services

Education and training services are used to teach and prepare individuals for employment through skills training and vocational or academic opportunities.

##### a. Postsecondary education

**Evidence from our review suggests that postsecondary education provides individuals with skills necessary for successful employment and an increased likelihood of employment and higher earnings**. However, individuals with I/DD are less likely to receive postsecondary education compared to individuals with other disabilities (4 percent versus 23 percent; [Grigal et al. 2014](#)). People with I/DD who attended a postsecondary education program tended to experience higher employment rates and earnings

(Qian et al. 2018). Individuals participating in a postsecondary education program were 26 percent more likely to be employed and earned 73 percent more wages compared to those who did not attend a postsecondary program (Migliore et al. 2009). Young adults with traumatic brain injury (TBI) who received training at a college or university had a higher rate of employment at VR case closure (60.4 percent versus 42.4 percent) and significantly higher mean weekly earnings (\$381.00 versus \$261.21) than those without training (Chan et al. 2020). These researchers used propensity score matching to conduct a matched case-control study among young adults with TBI receiving VR services. Individuals with I/DD who completed a certificate or degree while their VR case was open had significantly higher earnings compared to those who did not complete a certificate or degree (\$343.06 versus \$197.03) (Miller et al. 2019).

Skills training and individual supports are important components of postsecondary programs. The Transition and Postsecondary Education Programs for Students with Intellectual Disability (TPSID) model demonstration developed or expanded transition and postsecondary programs for students with intellectual disabilities. TPSID programs use person-centered planning to deliver services that support academic coursework, social skills, independent living and self-advocacy skills, and work experiences.<sup>3</sup> The annual report of TPSID program data identified in the Qian et al. (2018) literature review shows that 50 percent of participants had paid work while enrolled in the program, and 60 percent had a paid job at program completion (Grigal et al. 2018).

Overall, a scoping review exploring the effect of postsecondary education on employment outcomes for individuals with I/DD identified a lack of rigorous research methods, variation in time to program completion, differences in credential and certificate offerings, limited information regarding integration with campus courses, and activities reported in the literature. Additionally, the literature includes a wide variation of reporting across studies, and nearly all the studies identified in the review using non-experimental designs (Avellone et al. 2021).



### 5. Wraparound services and supports

**Wraparound services encompass a broad range of services to support people with disabilities with employment: information and referral, benefits counseling, transportation, maintenance, assistive technology, and personal assistance.** Focus groups of parents, providers, educators, and employers

identified wraparound services as important supports for CIE attainment among youth (Schutz et al. 2023). These informants focused on the following as key wraparound services: transportation; travel training; assistive technology and environmental modifications; and an increased number of support staff (providers, support staff, and teachers).

Wraparound services and supports are often a supplemental component of an employment intervention. For example, Pathways offered benefits counseling to help individuals understand how their earnings from work would affect their benefits (Sevak et al. 2019). Many of this evidence review's interventions include wraparound services, but the key component of the intervention is something other than wraparound services. Therefore, this section is not comprehensive of all studies that include wraparound services but rather focuses on the studies that specifically investigated a wraparound service as the primary component of the intervention. As a result, this section only contains studies highlighting

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<sup>3</sup> Additional program descriptions can be found here: <https://thinkcollege.net/projects/national-coordinating-center/what-is-a-tpsid>.



rehabilitation technology, also known as assistive technology. The studies on assistive technology included in this report are case studies with fewer than 15 participants or literature reviews analyzing findings across multiple studies.

**Assistive technology, such as applications on smartphones and tablets, can provide job coaching and task reminders to support people with disabilities in performing their job duties.** Assistive technology helps people learn or maintain specific behaviors that impact job performance and retention: staying on task, moving from task to task, and managing responses to obstacles such as unexpected changes or negative performance feedback ([Muharib et al. 2022](#)). Assistive technology should be paired with initial training and ongoing coaching for a greater likelihood of success (Muharib et al. 2022).

*a. Handheld technology*

**Handheld technology teaching vocational skills, such as food preparation and cleaning skills, have shown potential to assist people with disabilities working in CIE in studies with small samples.** This finding comes from a literature review of 11 studies involving a total of 32 participants with I/DD (Muharib et al. 2022). Handheld devices, such as smartphones and tablets, can support vocational skills in a variety of ways, for example by delivering text, audio, or pictorial cues; video modeling; and video prompting. Smartphones and other handheld devices are seen as more socially acceptable than having a job coach offer prompts as the individual is working. Compared to laptops or desktop computers, handheld devices are also easier to use on the job. Handheld devices are one part of an intervention, **but other components, such as training to use the technology, prompting, and self-monitoring, are needed rather than implementing the technology on its own.**

*b. Video-based interventions*

**Video-based interventions (VBIs) effectively teach job skills (such as food preparation and cleaning tasks) and some communication skills (such as making requests and responding to greetings)** ([Munandar et al. 2020](#)). The Munandar et al. (2020) literature review included 19 studies with a total of 158 participants encompassing youth and adults with ASD. VBIs are defined as strategies that incorporate visual and audio cues to teach or maintain skills through modeling behavior or providing feedback. VBIs often involve a video of a model (a peer or the person using the VBI) performing the target behavior. Video modeling was the most popular approach for VBI to help individuals learn new job skills. **VBIs are found to be more effective when combined with another form of support, such as in-person feedback or written instructions.**

*c. Virtual Reality Job Interview Training Program*



**VR-JIT, a virtual reality job training intervention, improved mock interview performance and increased the odds of obtaining a competitive position.** One RCT study, which we assessed as having a high evidence rating, observed statistically significant improvement in the intervention group’s live standardized job interview role-play performances, job relevant interview content, and interviewee performance ([Smith et al. 2014](#)).<sup>4</sup> The subsequent RCT study that expanded this research to include a six-month follow-up, to which we gave a moderate evidence rating, found that **53 percent of VR-JIT participants**

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<sup>4</sup> See Appendix Table C.2 for a full explanation of the evidence assessment rating assignments based on the Pathways Clearinghouse criteria.

**accepted a competitive position, defined as employment or a competitive volunteer position, compared to 25 percent of control group members.** These findings are statistically significant at the 10 percent level. For outcomes—such as in the number of weeks looking for a position, interviews completed, percentage of subjects who completed an interview, or percentage of subjects who received an offer—treatment and comparison group rates showed no statistical differences. Additionally, at the **5 percent level of statistical significance, VR-JIT statistically significantly increased the odds of attaining a competitive position, whereas post-training self-confidence and prior paid employment did not** (Smith et al. 2015a).<sup>5</sup> In both studies, the control group members received a “treatment as usual” condition. Both sample populations included individuals with ASD ages 18 to 31 who had lower support needs, were actively seeking employment, were currently unemployed or underemployed, and had at least a 6th grade reading level. The VR-JIT design is intended for adults with chronic mental illness and at least an 8th-grade reading level, which does not reflect the population of the studies. Additionally, the small sample size (N = 26) and the demographics of the population being mostly male limits the generalizability of these findings. Because the participation criteria excluded individuals with a diagnosis for a medical illness that significantly compromises cognition, with uncorrected vision or hearing problems, or those not actively seeking employment, the study findings may reflect selection bias.

The Virtual Reality Job Interview Training (VR-JIT) program focuses on improving job interview skills through job interview simulations with a virtual fictional human resources manager avatar. The program provides diverse interview experiences across three levels of difficulty by utilizing more than 1,000 recorded interviews. The avatar’s reactions are dependent on the quality of the responses provided. These sessions also cover other topics related to employment, such as resume writing, researching a job, hygiene, appropriate work clothing, types of questions to ask, reminders about eye contact, and whether to disclose a disability. Participants in the intervention are invited to five sessions, with each being approximately two hours long (Smith et al. 2014, 2015a).▲



**A descriptive study of VR-JIT found no significant impact on participants’ general self-efficacy or interview self-confidence** (Ward and Esposito 2019). However, 80 percent of participants stated they found VR-JIT to be more effective than other traditional interview trainings, and 92 percent would recommend the program to a friend. This study included 10 male and two female participants with ASD ages 18 to 22 participating in a transition program in California. The study examined pre-post changes in the participants’ self-efficacy, their view on their own ability to successfully complete a task, and self-confidence specific to their perceived interview skills.



**VIT-TAY, a virtual interview training intervention tailored for transition-age youth, increased the proportion of youth who achieved CIE** (Smith et al. 2021). In this study, which we assessed as having a high evidence rating, 25 percent of treatment group youth achieved competitive integrated employment, whereas no members of the control group youth achieved competitive integrated employment, a statistically significant difference at the 1 percent level.<sup>6</sup> Additionally, compared to the control group, the intervention group achieved

<sup>5</sup> See Appendix Table C.2 for a full explanation of the evidence assessment rating assignments based on the Pathways Clearinghouse criteria.

<sup>6</sup> See Appendix Table C.2 for a full explanation of the evidence rating assignments based on the Pathways Clearinghouse criteria.

**statistically significant improvements to mock interview total score and job interview anxiety but had no effect on job interview self-efficacy, achieving any employment type, or attending job interviews during the six-month follow-up.**

The sample population for this study included transition-age youth ages 16 to 26 with autism and at least a 3rd-grade reading level who were willing to be video recorded. Five school partners participated in the study representing public, private, and charter schools located across urban, suburban, and rural communities. The small sample (N = 71) and the population demographics being mostly male limits the generalizability of these findings. The study population excludes individuals with a documented medical illness compromising their cognition, an exclusion that presents a risk of selection bias in the sample. Additionally, the study was not fully powered to determine the effectiveness of the intervention, and the intervention dosage varied across participating schools.



**JobTIPS, a web-based employment training program, improved mock job interview scores both in interview content and delivery (Strickland et al. 2013).**

An RCT investigating the impact of JobTIPS, which we assessed as having a high evidence rating, found that the intervention more effectively taught content rather than delivery skills.<sup>7</sup> As a result, **participants produced more appropriate verbal responses to interview questions following the intervention, which raised their interview content score** with a statistical significance at the 1 percent level and a smaller statistically significant positive change on the interview delivery at the 10 percent level. The features accompanying those responses (for example, posture, eye contact approximation, and effect of facial expression) did not show statistically significant improvement. Some considerations in interpreting the findings and limitations of the study are the small sample (N = 22) and all participants being male. Additionally, the follow-up time lasted one week and did not involve any real-world employment outcomes, so it is unclear whether the skills learned would improve actual job interviews. The sample population included individuals ages 16 to 19 with lower support needs (Strickland et al. 2013).

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The Virtual Interview Training for Transition Age Youth (VIT-TAY) program tailors the VR-JIT program for transition-age youth with an autism diagnosis. VIT-TAY includes one additional virtual interviewer, is designed to be completed at the 4th-grade reading level, and includes additional job application training. This new model implements scaffolding so users can progress through three levels of progressively more difficult interviews. Researchers employed community-engaged methods to develop the changes in the intervention. For each enrollee, the intervention included 15 sessions lasting approximately 45 minutes each (Smith et al. 2021). ▲

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JobTIPS is a multimedia employment training program that covers topics related to identifying career interests, as well as finding, attaining, and keeping a job. This program uses theory of mind-based guidance, video materials, visual supports, and virtual reality practice sessions. Step-by-step instructions are often paired with icons to support comprehension, embedded video models, video scenarios, video quizzes, printable scripts, worksheets, organizational tools, and social narratives. Each JobTIPS participant also completed one 30-minute virtual world practice interview conducted via the Venugen platform, a virtual reality practice environment (Strickland et al. 2013).▲

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<sup>7</sup> See Appendix Table C.2 for a full explanation of the evidence rating assignments based on the Pathways Clearinghouse criteria.



*D. Other assistive technology*

**MotivAider devices reduced off-task behaviors at work** ([Mazzotti et al. 2020](#)). The self-management device, worn on a waistband or belt, alerted two students with a vibrating signal to ask their job coaches for feedback. Job coaches reported the intervention as socially important, acceptable, and feasible. Students agreed that the MotivAider device helped them improve their behavior at work and liked the MotivAider as a tool.

**Audio cuing improved job performance among three high school students with I/DD while video modeling for job training had no effect** ([Allen et al. 2012](#)). The job was performing in retail stores as a mascot in an inflatable costume. An attendant assisted the mascot and provided audio cues, such as “Chester, give that boy a high five” while the youth wore a hands-free headset. The interrupted time series study found benefits for audio cuing but not video modeling. After the introduction of audio cuing, rates of target multiple skills, such as waving or giving children high fives while wearing the uniform, improved immediately and substantially for each participant. Once audio cuing ended, participants went back to their average below targets. After the reintroduction of audio cuing, performance returned to the higher levels achieved earlier. The study authors suggested this is a promising intervention to help students with I/DD gain part-time CIE while in high school, but further study is needed to assess the feasibility of audio cuing in other job contexts.

**Job coaches reduced proximity and delivered prompts through bug-in-ear devices to college students that, in a small sample study, increased social interactions and maintained task engagement** ([Gilson and Carter 2016](#)). Participants, three students with an autism or I/DD diagnosis enrolled in a postsecondary education program, described this intervention as beneficial and unobtrusive. The Job Coaching Package used this discrete assistive technology to provide social-focused and task-related coaching to support independence during internship shifts. Although this sample size is small (N = 3), the multiple-probe single-case experimental design produced a promising starting point for future studies (Gilson and Carter 2016).

**Researchers conducted a series of focus groups with 13 adults with I/DD or parents of individuals with I/DD to explore the use of technology by individuals with I/DD in vocational contexts** ([Paul et al. 2022](#)). Focus group participants explained that the benefits of technology included increasing work productivity, helping focus on work, and assisting with planning. **Respondents said that supportive individuals and systems for training on the technology facilitated their use of technology in the workplace.** Employer rules, such as restricting Wi-Fi or recording on personal devices; the cost of devices and data plans; and the lack of training were the reported barriers for technology use at work. Some individuals with I/DD also noted that technology enabled them to have more opportunities both professionally and socially.



**6. Mentoring**

**Mentoring includes both peer and family mentoring supports to encourage CIE.** During events designed to support local employers to hire people with I/DD organized in one urban and one rural area, local community members discussed mentorship in terms of both employers and people with I/DD. The urban community highlighted Disability Mentoring Day events as an opportunity to connect job seekers with I/DD, employers, and other community members to build social capital ([Bumble et al. 2017](#)). **Both community groups**

**suggested that employers who had experience employing people with I/DD could mentor new employers by sharing success stories and advice.**



## 7. Other participant interventions

Parental expectations of youth employment and youth working for pay during the summers in high school are both strong predictors of postsecondary employment for youth with disabilities (Carter et al. 2012). These trends underscore the need to build parental and caregiver expectations early to encourage their children to pursue high school employment because youth working in high school increases the odds of securing employment (odds ratio of 2.34) after high school. Qian et al. (2018) suggested the need to convey why youth employment expectations are important to parents, possibly through schools providing parents training on this topic, in addition to encouraging self-determination by students.

This section explores two interventions that cut across person-level service types with the goal of providing work experiences to high school youth.

### a. *Linking Learning to Careers*



**Through an RCT study, researchers found mixed impacts of Linking Learning to Careers (LLC) on the income of transition-age youth. LLC**

occurred in each of the 12 VR district offices in Vermont among 800 youth (ages 14 to 24) who were already receiving VR services. The control group received the usual services for VR customers. This study, which received a high evidence assessment rating, found no statistical differences in percentages of treatment and control group members (66 percent and 61 percent, respectively) who had earnings within 24 months of program enrollment.<sup>8</sup> **LLC participation did, however, increase the likelihood of earnings among later enrollees at the 5 percent statistical significance level: 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.** The outcomes may have been mixed because although most participants had at least one work-based learning experience, few had more than one, and LLC service uptake varied across VR district offices. Additionally, the intervention impact may have been muted by more than half of the treatment group members having worked for pay at enrollment. As a result, the counterfactual for LLC may be strong, or LLC intervention is not markedly different from usual services ([Sevak et al. 2021](#)).

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The LLC demonstration project offered work-based learning experiences for high school students with disabilities, college exploration and coursework opportunities at a community college, team-based guidance from VR staff, dedicated assistive technology support, and transportation funding to support participation. A five-year Rehabilitation Services Administration (RSA) grant awarded in 2016 funded the LLC intervention.▲

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<sup>8</sup> See Appendix Exhibit C.2 for a full explanation of evidence ratings.

b. *Way2Work Maryland*



**Way2Work Maryland had no effect on income and employment attainment among high school students.** The population included 401 high school juniors or seniors with an Individualized Education Plan (IEP) or a Section 504 plan who attended school at one of eight Maryland local school systems. The control group received the existing services available to high school students with disabilities. Most enrollees (92 percent) completed at least one work experience, nearly three-quarters completed at least two, and almost half completed at least three work experiences during the program. **The results of this study, which received a high evidence assessment rating, found that Way2Work did not affect employment outcomes 24**

Way2Work Maryland is an enhanced service model which expanded VR services for transition-age youth, offered services more quickly, increased the number of work experiences, and fostered collaboration between staff in partnering agencies such as the local school districts and community rehabilitation providers. The intervention included an early referral to VR, multiple work experiences, and enhanced service collaboration with integrated training and technical assistance. A five-year RSA grant awarded in 2016 funded the Way2Work intervention (Mann et al. 2021).▲

**months after enrollment, the likelihood of engaging in paid employment during the past year, or the likelihood of being employed or enrolled in postsecondary education at the time they completed the follow-up survey.**<sup>9</sup> The lack of impact for this demonstration may have been because 24 months was not enough time to observe program effects or because Way2Work was not sufficiently different from usual transition services. Alternatively, the COVID-19 pandemic may have muted impacts, or Way2Work did not focus on the population of youth with disabilities who would most benefit from the program ([Mann et al. 2021](#)).

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<sup>9</sup> See Appendix Exhibit C.2 for a full explanation of the evidence rating assignments for all experimental studies based on the Pathways Clearinghouse criteria.

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## V. 14(c) Certificate Holder or Provider-Level Intervention Findings



This chapter explores the successes in transforming 14(c) certificate holders' service models as well as factors that support providers to transition their programming from SWE to promote CIE. Indeed, many 14(c) certificate holders still primarily invest their resources in segregated employment and non-work activities (Inge et al. 2009).

Understanding how transformation can occur for employers and service providers is important because they help people with disabilities to meet their support needs and achieve their goals. One literature review that screened 589 peer-reviewed articles found no evidence in support of segregated employment leading to beneficial employment outcomes (Taylor et al. 2023). Another literature review, which contained 25 studies focused on individuals with an ASD diagnosis, did not recommend sheltered workshops as a means to competitive employment (Schall et al. 2020). Further, integrated service models were associated with better employment outcomes than segregated employment. Framed by these findings, this chapter examines organizational transformation and provider-level changes that encourage CIE. Exhibit V.1 summarizes key findings from experimental studies by evidence rating, and Exhibit V.2 summarizes lessons learned identified by descriptive studies with employer and provider-level intervention components.

**Exhibit V.1. Key findings of experimental studies on employer and provider-level interventions, by evidence rating**

Intervention (authors and year)	Sample size	Outcome measures	Direction
<b>Low evidence rating RCTs</b>			
Assistive Technology (Butterworth et al. 2020): Provided performance feedback to participants while they were at work	Treatment group: n = 107 Control group: n = 80	<b>12-month follow-up:</b>	
		Hires	NS
		Hours	+**
		Earnings	NS
		Months to hire	NS
<b>Low evidence rating QEDs</b>			
Job Coaching Academy (Gilson et al. 2021): Training provided to high school transition educators.	Treatment group: n = 30 Control group: n = 22	<b>Job coaching views:</b>	
		I have been trained well on how to be a job coach.	NR
		I feel effective in my role as a job coach.	NR
		I feel knowledgeable about the best strategies to use in job coaching.	NR
		I think student/employee independence is an important part of job success.	NR
		I think social integration is an important part of job success.	NR
		Job coaching has a beneficial role in the workplace setting.	NR
		Most of my students are independent in practicing employment skills.	NR
		Most of my students are independent in practicing social skills.	NR
Coaching proximity faded over time.	+***		

Exhibit V.1 (continued)

Note: Asterisks in the direction column indicate the statistical significance: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . Significance testing results are not reported for outcome measures with direction listed as “NR.” High study evidence ratings indicate there is strong evidence that the findings are solely attributable to the intervention examined. Moderate evidence ratings indicate there is some evidence that the findings are attributable, at least in part, to the intervention examined. Other factors not accounted for in the study might also have contributed to the findings. Low evidence ratings indicate there is little evidence that the findings are attributable, in part or as a whole, to the intervention examined (Rotz et al. 2020). See [Appendix Exhibit C.2](#) for full details of the evidence assessment ratings and reasoning for each rating based on the Pathways Clearinghouse criteria.

NR = not reported; NS = not significant; QED = quasi-experimental design; RCT = randomized controlled trials.

## Exhibit V.2. Lessons learned identified in the descriptive studies on employer and provider-level interventions

### Lessons learned

- **Characteristics of successful organizational transformation:** A panel of experts used the Delphi method to identify the top 10 characteristics of successful organizations that transformed to focus on CIE.
- **Implementing organizational transformation:** A case study explored how organizations that completed this transformation operationalized those top 10 characteristics identified by the Delphi panel of experts.
- **Provider Transformation Network:** An intervention focused on the 10 elements of successful organizational transformation as well as applying the implementation strategies. This intervention is associated with four indicators of job development that increased after CRP participation.
- **Job coaches can support people with autism to maintain CIE.** Researchers conducting interviews with job coaches identified facilitating factors, barriers, and additional resources that would promote CIE.

CIE = competitive integrated employment; CRP = community rehabilitation provider.

### A. What interventions have been documented to encourage organizational transformation to promote CIE and end SWE?

The systematic evidence review includes studies that identified the characteristics of 14(c) certificate holders that successfully transitioned to CIE as well as the implementation process for transitioning organizations.

#### 1. Characteristics of successful organizational transformation

**Researchers from the Institute for Community Inclusion (ICI) at the University of Massachusetts Boston organized a Delphi panel of experts to identify the characteristics of successful organizations that transformed to focus on CIE (Lyons et al. 2018).** The Delphi panel, which consisted of 36 experts in the field of organizational transformation, identified and ranked characteristics of organizations that successfully transformed to focus on CIE. The characteristics, ranked by the panel in order of importance, are listed below in Exhibit V.3. The Delphi method is a technique to establish a reliable consensus among a group of experts. In this method, respondents are anonymous, the interview process is iterative and offers continuous and controlled feedback, data captured are statistically interpretable, and data collection can happen online. The selected experts were mostly female, White, between the ages of 51 and 70, reported holding a master’s or doctoral degree, and worked across 44 states. An iterative survey process produced the final data, with the second round of survey responses built from the first round of survey responses. The recruitment process resulted in 44 candidates, of whom 36 responded to both survey rounds.

**Exhibit V.3. Characteristics of successful organizations that transformed to focus on CIE, ranked by order of importance**

Organizational characteristic	Description
Clear and consistent goals	The organization explicitly committed to increasing CIE. Goals are defined as measurable, flexible to the needs of individuals, compelling and easy to understand, directly related to the mission, modifiable, and time bound.
An agency culture that values inclusion	The organization supports people to work in the community and no longer supports SWE in segregated settings.
An active, person-centered job placement process	Providers within the organization find jobs proactively with a focus on person-centered service delivery.
A strong internal and external communication plan	Communications within the organization consist of simple, visible daily practices and decisions with the expectation for CIE to be authentically centered. Externally, successful providers must make the community aware of themselves and their services.
Reallocated and restructured resources	All resources from service providers within the organization focus on community employment.
Ongoing investment in professional staff development	The organization provides opportunities for providers to maintain competencies and implement current best practices through training, continuing education, conference attendance, and mentorship.
A focus on customer engagement	The organization meets individual and market needs through engagement and partnership with stakeholders.
Effective employment performance measurement	Accountability must be shared across all staff throughout the organizational structure using a clear framework with impacts determined over defined time periods.
A holistic approach	Services provided by the organization consider the whole person and include wraparound life supports when needed. The career planning process should involve staff, parents, and friends.
Multiple and diverse community partnerships	The organization develops buy-in about the change by engaging organizations, state systems, and community partnerships.

Source: Lyons et al. (2018).

CIE = competitive integrated employment; SWE = subminimum wage employment.

**Researchers from ICI conducted a follow-up study to explore how organizations operationalized each of the ten characteristics identified through the Delphi panel (Timmons et al. 2019).** Through four case studies, organizations shared several implementation strategies (Exhibit V.4).

**This case study included four organizations that primarily worked with individuals who had I/DD, had successfully transformed to focus on CIE over the last 10 years, and provided integrated employment.** Researchers selected these four providers from 28 identified through members of the State Employment Leadership Network (<http://www.selnhub.org/home>), ICI staff professional networks, other content experts identified for a related research effort, and ICI’s mailing lists. The selection process considered the demographics of those who received services, historical strategic planning, stakeholder involvement, funding and communication strategies, and established partnerships. In total, 41 individuals interviewed across the four sites consisted of 18 in leadership positions, six in middle management, five frontline staff, six individuals with I/DD, two family members, and four external stakeholders (Timmons et al. 2019).



**Exhibit V.4. Implementation strategies for the 10 characteristics of successful organizations that transformed to focus on CIE**

Organizational characteristic	Implementation strategies
Clear and consistent goals	The organization developed measurable goals that allowed flexibility for individual needs set to an established time frame. Setting goals in this way supported organizations to take necessary steps to their long-term goal of workshop closure.
An agency culture that values inclusion	All daily practices and decisions within the organization are aligned with the organization's core beliefs. Building a culture on strong philosophical beliefs about supporting inclusion expedited growth in support for the organizational transformation compared to these changes occurring through mandates.
An active, person-centered job placement process	The organization avoided overwhelming staff by prioritizing job placement one person at a time. Providers deliberately began with individuals who could influence others and facilitate a positive snowball effect.
A strong internal and external communication plan	The organization clearly communicated authentic expectations to all internal and external stakeholders. Internal communication includes staff, individuals with I/DD, and family members. Externally, organizations marketed the transformation throughout the community.
Reallocated and restructured resources	Financial resources within the organization aligned with the new mission, which included changing how the organization funds services and staff time budgeting. Organizations attempted to identify and mitigate risk while also preparing for potential losses.
Ongoing investment in professional staff development	The organization provided professional development supports for staff to increase their skills and investments while also encouraging staff at all levels to contribute their ideas and energy to the new mission.
A focus on customer engagement	The organization developed strong connections through formal and informal strategies with job seekers with disabilities, families, employers, and policymakers. Formal strategies included newsletters, social media platforms, and email. Informal strategies included gatherings, such as barbecues or picnics.
Effective employment performance measurement	Over a defined time period, the organization established a clear framework for implementing and measuring strategies to enable progress tracking toward goals.
A holistic approach	The organization supported the whole person with wraparound services and used a career planning process that involved parents, friends, and staff.
Multiple and diverse community partnerships	The organization developed partnerships including, but not limited to, school districts, state agencies, colleges and universities, local business councils, employers, and social service agencies.

Source: Timmons et al. (2019).

CIE = competitive integrated employment; I/DD = intellectual and developmental disabilities.

**ICI researchers developed the Provider Transformation Network to apply the 10 elements of successful organizational transformation and identified increases in four indicators of job development among participating organizations (Lyons et al. 2022).** The job development indicators that improved included (1) person-centered planning: persons with a disability plans their future through collaboration with service providers and other important people in their lives; (2) Discovery: services to identify individual interests, goals, and abilities; (3) engagement with family or friends: service practices promote employment while encouraging participation and maximizing expectations of family and friends;



and (4) time spent with employers: developing employment opportunities through direct coordination with employers. **As further evidence of the success of these practices, CRPs that participated in Year 1 reported that 29 percent of individuals selected to obtain CIE did so and earned an average of \$9.79 per hour. Similarly, CRPs participating in Year 2 reported that 26 percent of selected individuals achieved CIE and earned an average of \$9.50 per hour.** The generalizability of these findings may be limited because the study employed a convenience sample of service providers involved with the Arc, which has governing rules and regulations to which many service providers do not adhere. The researchers offered four considerations to service providers in supporting individuals to find CIE: (1) identify a priority group, (2) implement an active and person-centered job placement process, (3) engage key stakeholders in job development, and (4) focus on individual job placement within the context of the 10 elements of organization transformation identified by the Delphi expert panel.

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The Provider Transformation Network was a one-year comprehensive technical assistance pilot designed to support organizational transformation away from sheltered workshops toward a focus on CIE and delivering job development supports. Among participating service providers, five were randomly assigned to participate in Year 1, and five were randomly assigned to participate in Year 2. The model includes an in-person two- to three-day site visit, an organizational self-assessment, provision of service tracking techniques, a leadership summit, and technical assistance. Participants gained access to an online toolkit developed by the intervention team (<https://act.thinkwork.org/>).▲

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**The GAO published a study that identified organizational factors that influence an individual to remain in SWE or transition to CIE, such as staff capacity to support CIE and whether organizational leadership views CIE as a good outcome.** Drawing on expert interviews, interviews with 14(c) certificate holder leadership and state officials, and a literature review, the GAO identified factors that can influence an individual’s transition from SWE to CIE. According to [Curda \(2021\)](#), the main factors included (1) the extent the certificate holder is willing and able to implement changes to its business model to support individuals’ transition to CIE, such as the sufficiency of resources and funds to promote CIE, and (2) CIE employers’ views towards workers with disabilities and their “willingness or ability to hire or provide employment flexibilities to individuals” transitioning from SWE. Other factors, such as local economic, public policy, and worker-level attributes, can also influence an individual’s transition from SWE to CIE.

## 2. Improving the management information system

**The implementation practices among CRPs described above could benefit from an established tracking system** ([Migliore et al. 2022](#)). Updating how the management information system is used could support providers in scaling up the employment outcomes of people with an intellectual disability, autism, and other developmental disabilities. Currently, providers use management information systems for automating billing and compliance. Because federal and state policy guidelines determine how the management information system is currently used, updating these guidelines could change how employment providers leverage their data, improve the effectiveness and efficiency of employment providers, and scale up employment outcomes for individuals with disabilities seeking a job. **These new guidelines could focus on a commitment to tracking continuous quality improvement metrics, providing employment consultants with data-enabled performance support, integrating input from people with disabilities and families, ensuring interoperability across other systems, and leveraging data for research.**

### 3. Enhancing a CE intervention for employers

**Interviews with practitioners and participants about ACCESS identified information sessions as a key part of recruitment, the extension of the intervention time frame to eight or nine months, and specific strategies to reduce attrition (Smith et al. 2019).** Although the pre-study recruitment survey showed numerous eligible interested participants among the 900 eligible individuals who received an emailed flyer through a regional autism center’s database, few responded during recruitment. Potential participants shared in interviews that they **preferred information sessions to the virtual flyer because they desired an opportunity to ask questions before enrolling.**

Although the typical time frame for demonstration projects related to the CE process is four to six months, researchers have identified that, for individuals with ASD, the time is closer to eight or nine months to accommodate the robust Discovery process, competing work priorities for providers, scheduling challenges between participants and providers, and provider turnover. **Researchers hope to reduce attrition by screening practitioners and assessing participants’ work motivation.** Because one provider was not successful with any of the individuals served, researchers hypothesize that the attrition may be a result of that specific provider and not the intervention. This situation highlights that well-trained practitioners must implement CE services. Additionally, the next round of the study will include a work motivation assessment that will allow individuals to define successful outcomes for themselves for this intervention. Overall, researchers concluded that an intervention can be more sustainable and effective through a collaborative approach to training, implementation, documentation, evaluation, and pre- and post-employment supports.

The study used a randomized pre-test post-test experimental control group design, but the current publication is an open trial with a small sample size (N = 10) to test the feasibility and acceptability of the intervention (Smith et al. 2019). The participants are mostly male and White and reported a paid work history. Inclusion criteria for the study meant being age 22 or older, having a moderate speech capacity determined by discourse competence, having a score of 70 or greater on the Kaufman Brief Intelligence Test, and using English as a primary language. Researchers excluded individuals with a history of harming themselves or others. A pilot survey emailed to 418 eligible center constituents determined the feasibility of recruitment tests.

#### B. What interventions have been documented to encourage service providers to promote CIE and end SWE?

The systematic evidence review identified studies that capture perspectives shared by providers to best promote CIE, as well as interventions to train providers to build internal capacity.

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Achieving Competitive, Customized Employment Through Specialized Services (ACCESS) intervention protocolizes the CE process to improve employment outcomes for adults with an ASD diagnosis. This study promotes consistency across the intervention through tools, templates, and logs. ACCESS development included elements from other popular CE models, feedback from stakeholder groups, and “The Essential Elements of Customized Employment for Universal Application” (Y-TAC and WINTAC 2017), a resource published by the Workforce Innovation Technical Assistance Center.▲

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## 1. Job coaches supporting CIE

**Semi structured interviews with 11 job coaches in supported employment programs identified facilitating factors, barriers, and additional resources that promote CIE among employees with an autism diagnosis (Kim 2022). One theme across the facilitating factors is communicating the characteristics of autism to employers.** This communication allows employers to understand that employees with autism may have an increased ability to pay attention and that employees’ ability to maintain their jobs is supported by day-to-day consistency. Additionally, supports and positive working relationships among job coaches are important facilitating factors. **Key barriers included a deficit of understanding about autism among employers and employees, inevitable changes in routine, and social communication difficulties.** The additional resources that job coaches identified aligned well with amplifying the facilitating factors and mitigating the barriers. Job coaches educated employers and co-workers about autism and reported that structured training sessions would be beneficial for employers and co-workers. **More opportunities for practical training and evidence-based training programs would assist job coaches in supporting employees with autism.** Moreover, improving structural support for all stakeholders to collaborate would also take some burden off job coaches.

## 2. Job Coaching Academy



**The Job Coaching Academy, a professional development pilot program designed to improve the skills of job coaches, had a positive impact on job coaches, although we assessed the study as having a low evidence rating (Gilson et al. 2021).<sup>10</sup>**

Researchers in the comparison group QED study found that the Job Coaching Academy had larger improvements in the skill development of job coaches when educators received the training in August rather than in January. Their perceptions of students’ independence and social skills acquisition also depended on this timing. In this study, the treatment group received the training in August, whereas the control group received the training in January or February. Before the intervention, about 14 percent of the treatment group and 9 percent of the control group responded yes to “Most of my students are independent in practicing employment skills.” After the intervention, these shares changed to 48 percent of the treatment group and about 24 percent of

The Job Coaching Academy is a one-day training provided to 46 transition educators working in three school districts. This intervention communicated the importance of early work experiences and school-based preparation, described strategies to establish sustainable independence among youth, and promoted inclusive workplaces. The intervention training content is drawn from a systematic literature review of the efficacy of instructional practices for employment skills geared toward secondary students with I/DD, the evaluation of the evidence-based practices selected by the National Technical Assistance Center on Transition, and academic publications. The treatment group received the Job Coaching Academy training in August before the school year began and then provided feedback on the training. The control group received the training the following January or February. Data were collected from both groups before the training as well as five months after completing the training. Each training session focused on small groups of four to 13 job coaches and lasted about six hours with two short breaks and a lunch break.▲

<sup>10</sup> Although this study describes itself as a QED, it randomizes participants into treatment and control groups, so the study was reviewed as an RCT. This study reported high sample attrition between random assignment and analysis, so the study design was ultimately assessed as a QED. The study did control for any potential differences in the outcome before the intervention. See Appendix Table C.2 for a full explanation of the evidence rating assignments for all experimental studies based on the Pathways Clearinghouse criteria.

the control group. In a similar trend, before the intervention, 25 percent of the treatment group and about 14 percent of the control group responded yes to “Most of my students are independent in practicing social skills.” After the intervention, 56 percent of the treatment group and about 24 percent of the control group responded affirmatively. Although the authors include no statistical tests for these findings, the associations indicate that the training had larger increases in job coaches’ perceived self-efficacy providing job coaching, and growth in educators’ coaching behaviors when the training was delivered in August rather than in January or February. Additionally, **job coaching proximity faded over time at a statistically significant level, indicating students’ increased independence.** One limitation in interpreting the student outcomes is that they are only the perceived outcomes as observed by the job coaches. Job coaches were mostly women, and their job titles include paraprofessionals, special education teachers, and interveners. These job coaches worked with 131 transition-age youth. Of the students included in the study, 73 percent had a primary diagnosis of an intellectual disability, and most of the remaining students had a primary diagnosis of autism.

### 3. Assistive technology to support employment consultants



**Assistive technology can be leveraged to provide on-the-job feedback to support employment consultants and increase the job seekers’ number of hours worked** (Butterworth et al. 2020). We assigned

this RCT study exploring the impacts of the 12-month intervention with a low evidence rating.<sup>11</sup> After the intervention, the number of hours worked per week increased by 3.5 for the treatment group, compared to a decrease of 2.4 hours by the control group. For context, at baseline the treatment group worked 16 hours per week, and the control group worked 19 hours per week. The treatment and control groups did not have a statistically significant difference on other measures, such as acquiring a job, earnings, and number of months looking for a job. A total of 187 employment consultants enrolled in the program, of whom 120 participated for the entire year. The sample of employees included individuals with an intellectual or developmental disability who recently gained employment through an employment consultant. Some limitations of the study are that participants did not equally utilize all elements of the intervention, and the population in the sample was mostly female. Moreover, the community of practice and online learning features had limited engagement by the employment consultants, whereas the daily survey response rates were relatively high.

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During this 12-month intervention, assistive technology documented behavior and provided performance feedback to participants while they were physically present at work. The assistive technology included a daily survey that promoted reflection and data-enabled performance feedback. It also provided information about standards of effective employment supports. A monthly community of practice with employment consultants shared findings from survey data and lessons learned. Online learning and distance mentoring offered to employment consultants strengthened their employment support strategies. Additionally, microlearning (tips, short videos, and articles) nudged employment consultants to implement strategies.▲

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<sup>11</sup> This study reported high sample attrition between random assignment and analysis, so although the study is an RCT, the study design is assessed as a QED. The study did not indicate controlling for any potential differences in the outcome prior to the intervention. See Appendix Table C.2 for a full explanation of the evidence rating assignments for all experimental studies based on the Pathways Clearinghouse criteria.

## VI. System-Level Intervention Findings



System-level interventions hinge on strong partnerships to transform policies, payment structures, and service systems to prioritize people with disabilities achieving CIE. System change efforts often advance policy initiatives to prioritize CIE in state policies, public programs, and practice. In many states, system transformation to promote CIE also leads to the development of new service or program innovations to address known barriers to employment. This chapter summarizes the evidence base of system-level interventions that have been implemented to expand CIE among youth and adults with disabilities, with a focus on cross-sectoral collaborations, state policy changes, and other system-level interventions that have been tested in diverse state contexts. By design, many of these interventions are multifaceted and incorporate elements documented in Chapters IV (person-level intervention findings) and V (14(c) certificate holder or provider-level intervention findings). Exhibit VI.1 summarizes key findings from experimental studies by evidence rating, and Exhibit VI.2 summarizes lessons learned identified by descriptive studies with system-level intervention components.

**Exhibit VI.1. Key findings of experimental studies on system-level interventions, by evidence rating**

Intervention (authors and year)	Sample size	Outcome measures	Direction
<b>High evidence assessment rating RCTs</b>			
Disability Employment Initiative (Klayman et al. 2019): Provided training and support services across systems to improve job placement.	Treatment group grantees: n = 80	Exited and employed or enrolled in school in the subsequent calendar quarter (youth)	-*
	Control group grantees: n = 73	Exited and attained a degree or certificate within the following three quarters, among those who were high school dropouts or attending school at the enrollment date (youth)	-**
		Exited and employed in the subsequent calendar quarter (adults)	NS
		Exited and employed in the following three quarters (adults)	NS
		Average earnings in the three quarters after exit, among those working in all three quarters (adults)	NS
<b>Low evidence assessment rating RCTs</b>			
Project SEARCH+ASD (Wehman et al. 2014): Offered immersive school-to-work internships with design features focused on ASD supports.	Treatment group: n = 24	Acquired employment by June or July after nine-month school year after enrollment in the study	+***
	Control group: n = 20	Acquired employment by September or October, one-year after enrollment in the study	+***



Exhibit VI.1 (continued)

Intervention (authors and year)	Sample size	Outcome measures	Direction
Project SEARCH+ASD (Wehman et al. 2017): Offered immersive school-to-work internships with design features focused on ASD supports.	Treatment group: n = 24	Competitive employment at high school graduation	+***
	Control group: n = 20	Competitive employment three months after the intervention	+***
		Competitive employment one-year after the intervention	+***
		Hours worked weekly at graduation (among employed individuals)	NS
		Hours worked weekly three months after the intervention (among employed individuals)	NS
		Hours worked weekly one-year after the intervention (among employed individuals)	+**
Project SEARCH+ASD (Wehman et al. 2020): Offered immersive school-to-work internships with design features focused on ASD supports.	Treatment group: n = 81	Employed in the community without supports at graduation	NR
	Control group: n = 75	Employed in the community without supports at one-year follow-up	NR
		Employed in the community with supports at graduation	NR
		Employed in the community with supports at one-year follow-up	NR
		Employed in the community with supports 10 hours a week or fewer at graduation	NR
		Employed in the community with supports 10 hours a week or fewer at one-year follow-up	NR
Project SEARCH+ASD (Schall et al. 2020a): Offered immersive school-to-work internships with design features focused on ASD supports.	Treatment group: n = 81	<b>SIS-A score changes from one-year follow-up – baseline:</b>	
	Control group: n = 75	Home living	NS
		Community Living	NS
		Lifelong Learning	+*
		Employment	+**
		Health Safety	+*
		Social	NS
		Total	+*
		SNI, from one-year follow-up – baseline	NS
Exceptional behavior, from one-year follow-up – baseline	NS		

Note: Asterisks in the direction column indicate the statistical significance: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . Significance testing results are not reported for outcome measures with direction listed as “NR.” High study evidence ratings indicate there is strong evidence that the findings are solely attributable to the intervention examined. Moderate evidence ratings indicate there is some evidence that the findings are attributable, at least in part, to the intervention examined. Other factors not accounted for in the study might also have contributed to the findings. Low evidence ratings indicate there is little evidence that the findings are attributable, in part or as a whole, to the intervention examined (Rotz et al. 2020). See [Appendix Exhibit C.2](#)

Exhibit VI.1 (continued)

for full details of the evidence assessment ratings and reasoning for each rating based on the Pathways Clearinghouse criteria.

ASD = autism spectrum disorder; CIE = competitive integrated employment; NR = not reported; NS = not supported; Project SEARCH+ASD = Project SEARCH including autism spectrum disorder; RCT = randomized controlled trials; SIS-A = Supports Intensity Scale® – Adult version; SNI = social needs index.

Exhibit VI.2. Lessons learned identified in the descriptive studies on system-level interventions

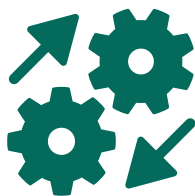
Lessons learned

- **Transition and Customized Employment Project:** Most enrolled transition-age youth worked in CIE.
- **States may save money by shifting their policies away from SWE to CIE:** On average, states annually spend \$9,746 per person in facility-based work settings compared to \$7,847 per person on integrated employment.
- **Partnerships in Employment (PIE) system change projects:** Six states offered students with disabilities opportunities to gain work experience and develop job skills and other funded activities that created state policy change to achieve positive employment outcomes.
- **Customized employment through Guided Group Discovery:** Students reported learning more about themselves, their own skills, and conditions for success.

CIE = competitive integrated employment; SWE = subminimum wage employment.

A. What interventions have been documented to encourage CIE and end SWE at the system-level?

1. Cross-sectoral collaborations



Collaborations with cross-sectoral partners, such as employers, school districts, and state agencies that administer education and disability-related supports, have helped many states advance system changes to promote CIE.

a. Project SEARCH

**Descriptive studies of Project SEARCH found it helped youth build skills gained through real-world experience working in a business setting.**

One qualitative study explored participants' experiences with Project SEARCH (Almalki 2019). Three Project SEARCH staff and two coworkers of interns with I/DD who worked in a hospital setting were interviewed to understand their perceptions of the supported employment practices implemented within Project SEARCH. The findings reveal that coworkers' positive attitudes toward working with interns in the hospital helped to make Project SEARCH a successful transition program. According to study informants, the **interns improved important skills such as their social, communication, and vocational skills**. One challenge identified by coworkers related to communicating with the interns; some interns had communication issues that made it hard for

The Project SEARCH model is grounded in collaboration between school districts, employers, and service providers across the disability service continuum to braid funding streams, collaborate around service delivery, and offer immersive school-to-work internships to youth with I/DD in more than 600 sites across the United States. To qualify as an intern for Project SEARCH, high school youth must have an IEP and be eligible for VR services.

Adult programs serve young adults ages 18 to 30 or an age range that supports the cohesiveness of the group that is eligible for VR services.▲

their coworkers to support them. **The author recommended offering short courses, training programs, and vocational consultations on how to work and communicate with interns who have I/DD to foster collaboration and communication.** These interviews did not include the perspective of the interns who received services and were conducted at one Project SEARCH site, so the findings are not generalizable.

**The state of New York adapted the Project SEARCH model to support people working in sheltered workshops to transition to CIE; eight of 10 people completed the program, and five of these successfully transitioned from SWE to CIE.** Positive outcomes were reportedly associated with the time spent in the sheltered workshop setting before engaging in Project SEARCH. According to [Christensen et al. \(2017\)](#), **all participants who had been in the workshop for fewer than five years secured CIE; none of the individuals who had been in the workshop for more than five years made a successful transition to CIE.** The state also expanded Project SEARCH from four to 16 sites statewide and adapted the service model for adults with disabilities in four sites. Over the five-year evaluation period, across all sites, 396 students completed Project SEARCH, with 247 (62 percent) transitioning into CIE jobs working 20 hours per week at or above minimum wage ([Christensen et al. 2017](#)). Longitudinal outcomes of Project SEARCH in upstate New York appear in [Christensen et al. \(2015\)](#). In Monroe County, New York, Project SEARCH reportedly had a success rate of 84 percent of program completers exiting into employment over the first four years of implementation, which surpassed the national average success rate of 68 percent of program completers exiting Project SEARCH into employment.

*b. Project SEARCH+ASD*



**Four RCTs, which received a low evidence rating, found a modified version of Project SEARCH that includes autism spectrum disorder (Project SEARCH +ASD) supports improved employment or independence of youth.**<sup>12</sup> Elements were added to the Project SEARCH model to meet the vocational, learning, communication, and social support needs of youth with ASD. These additional supports included systematic instruction provided on the business site, support from a behavioral specialist who provides applied behavior analytic strategies to support interns with ASD in the business site, and intensive staff training ([Wehman et al. 2020](#)). The first study found that at both the nine-month and 12-month follow-up, the treatment group acquired employment (87.5 percent for both periods) at a statistically significantly higher rate than the control group (6.25 percent for both periods) ([Wehman et al. 2014a](#)). Two studies that expanded this research found that at 3 months and 12 months after the intervention, the treatment group achieved competitive employment (90 and 87 percent, respectively) at a statistically significantly higher rate than the control group (6 and 12 percent, respectively; [Wehman et al. 2017, 2020](#)). Researchers in another study found that one year after the intervention, the treatment group's support intensity needs improved at a higher rate compared to the control group across the Supports Intensity Scale® (SIS)-Adult version (SIS-A) scales overall, as well as for the individual subscales on lifelong learning, employment, and

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<sup>12</sup> Schall et al. (2020a) and Wehman et al. (2020) the study reported high attrition, did not indicate controls for any potential differences in the outcome before the intervention, and indicated the baseline equivalence requirement was not satisfied. Wehman et al. (2014a) reported high sample attrition between random assignment and analysis, and did not indicate controlling for any potential differences in the outcome before the intervention. Wehman et al. (2017) reported high sample attrition between random assignment and analysis, and age did not balance across the treatment and control groups. See Appendix Exhibit C.2 for a full explanation of evidence rating assignment for all experimental studies based on the Pathways Clearinghouse criteria.



health safety.<sup>13</sup> The changes between the treatment and control group did not differ at a statistically significant level for the subscales on home living, community living, and social. Participants' degree of independence was measured using the SIS-A to evaluate the intensity of support needed by an individual with a disability to be successful in various life activities (Schall et al. 2020a). Although this study did not report significance tests, another study found that one year after the intervention, the treatment group achieved far higher rates of employment in the community with supports and slightly higher rates of employment in the community with supports 10 hours a week or fewer compared to the control group (Wehman et al. 2020). In each study, the control group received services determined by their IEPs. These findings might not be generalizable across internship types, as all four studies occurred in hospital settings. The generalizability of outcomes from these four studies is further limited by the sample population being disproportionately male.

**Other descriptive studies explored Project SEARCH +ASD, suggesting that the intensive supports helped youth with ASD achieve CIE.**<sup>14</sup> A descriptive study featuring two case studies of youth with ASD who received Project SEARCH +ASD maintained CIE after graduating from the program (Ham et al. 2014). The intensive supports included behavioral interventions, job modifications, self-monitoring plans, and job coaches who trained employers to communicate successfully with the individuals, among others. The case studies describe **the positive impact of intensive supported employment with the addition of targeted supports for workers with ASD** at their work site following their graduation from high school. A literature review that identified evidence-based employment practices that help youth and adults with ASD achieve CIE echoed these findings (Schall et al. 2020). The review includes 25 articles categorized by methodological rigor. Results from the most rigorous studies included in the review suggested a high rate of transition-to-employment using the Project SEARCH +ASD model, with CIE outcomes ranging from 73 to 90 percent for participants with ASD and I/DD, compared with a range of 6 to 17 percent employment for those randomized to control groups (Wehman et al. 2017).

*c. Disability Employment Initiative*



**One RCT found no evidence that the Disability Employment Initiative led to changes in employment outcomes for adults and found negative effects on placement outcomes for youth.** Overall, the study received a high evidence assessment rating, but the youth outcomes received a low evidence assessment and adult outcomes received a high evidence assessment rating.<sup>15</sup> Among adults, researchers observed no statistically significant differences across the share of the group exiting to employment or on average income. For youth, the key outcome variable was exiting to employment or education, measured as ceasing to receive services and being either employed or enrolled in school during the following quarter. Youth in the DEI treatment group had worse placement outcomes than youth in the control group. **Among youth, the control group exited either employed or enrolled in school at a statistically significantly higher rate, by 18**

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<sup>13</sup> According to Wehman et al. (2017), the SIS-A is a standardized interview that measures support intensity in terms of the type of support needed in six subscales (home living, community living, lifelong living, employment, health and safety, and social).

<sup>14</sup> According to Schall et al. (2020), the ASD supports address the vocational, learning, social, and communication needs of people with ASD and I/DD or other comorbid disorders.

<sup>15</sup> See Appendix Exhibit C.2 for a full explanation of the evidence rating assignment.

percentage points, relative to the treatment group. The control group received standard workforce services. At randomization, the sample included 21,840 adults (21 years or older) and 1,270 youth with disabilities (ages 14 to 21) across 179 organizations. Potential reasons for the lack of intended impact may have been due to the implementation of the grant requirements varying widely across states or differences in work related factors, such as job readiness, that differed between the two groups. ([Klayman et al. 2019](#)).

## 2. State policy changes



State policy changes to promote CIE are informed by data analyses that identified trends in the use of employment services and employment outcomes. State policy changes also stemmed from service system transformations intended to improve outcomes for people with I/DD.

### a. Data analyses drives policy and practice

**Analyses of administrative data reveal trends in the use of employment services and supports that could inform policy changes to improve employment outcomes among people with disabilities.** One study analyzed 2018–2019 National Core Indicators data to examine trends in the use of day and employment services among people with disabilities accessing services ([Houseworth et al. 2022](#)). **Findings reveal that non-Hispanic White people were more likely to secure community-based employment compared to people of other racial and ethnic backgrounds** (African American, Hispanic/Latino, Asian, and others), who were more likely to engage in unpaid day activities. People identifying as African American were also more likely to participate in facility-based work. This study points to individual and environmental factors that shape people’s experiences accessing services and impact their employment opportunities and outcomes. These study findings reinforce the importance of monitoring service use to identify disparities and opportunities to embed equity in publicly funded service programs.

**Analyses of Medicaid HCBS waiver program data indicate wide variation in allocation of funds for supported employment services across states.** [Friedman and Rizzolo \(2017\)](#) analyzed Medicaid HCBS waiver program data to examine how HCBS waivers allocated supported employment services in federal fiscal year (FFY) 2014. Study findings reveal that although \$816 million in funding was allocated for supported employment services, it made up a small percent (3 percent) of total HCBS spending. **In comparison, 18 percent of FY 2014 HCBS I/DD spending (\$5.6 billion) was projected for day habilitation services.** Furthermore, total projected waiver spending varied widely across states and by waiver, from a low \$96,000 in spending for HCBS provided through one I/DD waiver in Wyoming to a high of \$120 million provided through two I/DD waivers in New York. Hourly service rates for supported

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The Disability Employment Initiative (DEI) provided training and support services across systems within 31 state grantees to improve job placement among youth and adults with disabilities. Each state grantee met the following program requirements:

1. Selected a youth or adult focus
2. Ensured physical and programmatic accessibility of participating American Job Centers
3. Implemented at least two of the DEI service delivery strategies
4. Completed a sustainability plan for the period after the grant

The DEI also included two grant-funded leadership positions that supported grantees by providing expertise in workforce development and also support in Ticket to Work and Employment Network program management. This initiative was funded by DOL, Employment and Training Administration and Office of Disability Employment Policy ([Klayman et al. 2019](#)).▲

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employment services were also highly variable ranging from \$6.80 an hour, below the federal minimum wage, to \$203.18 an hour. The authors posit that the observed variability reflects the flexibility that the Centers for Medicare & Medicaid Services offers state Medicaid agencies in tailoring waiver programs to support the diverse needs of eligible populations.

**An analysis of national employment 2017 service data for 30 states indicates that, on average, states annually spent \$9,746 per person on facility-based work settings compared to \$7,847 per person on integrated employment** ([National Council on Disability 2020](#)). The National Council on Disability conducted an analysis of the AbilityOne program and examined the use of 14(c) certificates by CRPs on AbilityOne contracts. CRPs typically used the 14(c) certificates under the AbilityOne Program to pay less than the prevailing wage for the job but at least the federal or state (if higher) minimum wage rate. Nonprofit organizations that are part of the AbilityOne network also use the certificates to pay subminimum wages to employees with disabilities who do not work on AbilityOne contracts. Several nonprofit organizations reported that many workers with disabilities requested to work fewer hours or declined pay raises because of concerns with how their wages might impact their federal disability benefits. **Workers who had significant disabilities reported that technology was vital for increasing opportunities to successfully work in the community.** Also, the increased availability of CE made it possible for more people with significant disabilities to secure and maintain CIE through the use of flexible strategies.

### *b. Understanding VR agency services and outcomes*

**Using job-related services or having specific personal characteristics, such as being a male or White service user, increased the likelihood of integrated employment at case closure.** This secondary data analysis of VR data examined more than 10,000 people with a primary or secondary impairment of autism spectrum disorder (ASD) ([Nye-Lengerman 2017](#)). **Female and Black service users had lower successful integrated employment outcomes than their male and White peers. The study also identified associations between job-related services and increased odds of employment at closure.** The five most common services used by people with ASD in VR were assessment, VR counseling and guidance, job search, job placement, and on-the-job supports. Receiving job search, job placement, and on-the-job supports increased a person's odds of exiting VR in integrated employment by 34 percent, 224 percent, and 287 percent, respectively ([Nye-Lengerman 2017](#)). ASD categories (cognitive, communicative, and other mental) predicted reduced odds of use of assessment and VR counseling and guidance when compared to the ASD psychosocial category. Women had decreased odds of receiving job-related services. Race was significant in relation to job search services; service users of Asian/Pacific Islander descent experienced 33 percent reduced odds of using job search services compared to White service users. State systems also influenced administrative and job-related services.

**Job-related VR services and personal characteristics, such as being male, are associated with improved employment outcomes for students** ([Roux et al. 2021](#)). The study population included 44,000 students ages 16 to 21, non-student youth ages 16 to 21, and young adults ages 22 to 39 with a primary or secondary disability of ASD. Students experienced two to three times the odds of successful employment at VR exit if they received on-the-job support and job placement. **Students who used job search services and VR counseling had 1.3 to 1.7 times higher odds of employment, though Black students and female students had lower odds of receiving job search services.** Females, individuals receiving SSI or SSDI at VR application, individuals with co-occurring intellectual or psychiatric disability, and individuals who had a significant disability experienced lower odds of achieving employment at VR exit. Non-student youth and young adults were more likely to use job-related, transportation, diagnosis, and

treatment services than students were. Students were significantly more likely to use job readiness and other trainings compared to non-student youth and young adults. Students received an average of 4.1 different VR services—significantly fewer than non-student youth (mean = 4.35) and have significantly lower mean costs (\$5,424) than non-student youth (\$5,978), but higher costs than young adults (\$4,697). **Fifty-two percent of students were employed at VR closure, significantly lower than non-students (58 percent) and young adults (66 percent). Students also earned significantly less (\$231.50/week) than non-student youth (\$245.40/week) and young adults (\$280.80/ week).**

*c. PIE Systems Change Projects*

**Many initiatives for state system changes resulted in policy changes that promote CIE.**

[Tucker et al. \(2017\)](#) reported findings from the national evaluation of the PIE Systems Change Projects. Many PIE states **revised or developed state policies to promote system changes that promote CIE among people with I/DD.** The policy changes included “changing Medicaid reimbursement or payment structures to encourage employment supports or remove incentives for segregated employment, revising eligibility requirements or application protocols for Medicaid to expand access to employment supports for youth with I/DD, and shifting education policy to support employment preparation” ([Tucker et al. 2017](#)).

Iowa, for example, restructured its Medicaid rate

reimbursement structures for employment services to promote community-based employment. According to [Butterworth et al. 2017](#), five of the eight states enacted Employment First policies, either through legislation (Mississippi in 2015, California in 2013, and Alaska in 2014) or a Governor’s Executive Order (Tennessee in 2013 and New York in 2014). Tennessee reportedly enacted legislation that makes scholarship support available to students with I/DD who are participating in postsecondary education. Also, six of the PIE states had a “backbone” organization with staff and requisite skills to support the entire initiative; this situation was identified to be an essential condition for collective impact.

**States also developed and implemented model projects to address systematic barriers to CIE.** Six states awarded PIE grants **offered students with disabilities opportunities to gain work experience and develop job skills.** One state developed toolkits to scale up promising practices to connect students with employment in the community, others raised awareness of postsecondary educational opportunities for students with I/DD, and California expanded the state’s College2Career Program to **create pathways for students with I/DD to pursue postsecondary education.** PIE states also **engaged businesses in the community** to build relationships with employers and open business leaders’ minds to the possibility of hiring youth with I/DD. Three states also **strengthened the capacity of their service systems by training benefits counselors and CRPs and developing alternative certificates to support school-based employment readiness and career training** ([Tucker et al. 2017](#)).

**The California PIE project effected system change to improve employment outcomes among people with I/DD through strong collaborative leadership across state and local agencies.** The state formed the California Employment Consortium for Youth with I/DD (CECY) program composed of 45

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The Administration for Community Living awarded federal grants to eight states in 2011 and 2012 to implement PIE Systems Change Projects. Under this demonstration, states formed coalitions to enhance interagency and cross-sectoral collaborations, develop and implement projects that expand CIE, and improve policies and practices for youth and adults with I/DD.

In FY 2011, the Administration on Intellectual and Developmental Disabilities (AIDD) awarded six grants to California, Iowa, Mississippi, Missouri, New York, and Wisconsin.

In FY 2012, AIDD awarded grants to Alaska and Tennessee. ▲

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representatives from 25 local and state agencies, associations, organizations, families, and self-advocates, worked to improve state system capacity to support youth and young adults with I/DD to gain CIE. According to [Raynor et al. \(2017\)](#), the CECY focused on interagency collaboration, improved understanding of effective practices for youth with I/DD to work in CIE, and effecting policy change at state and local levels to increase employment outcomes. The CECY used the High Performing States Framework as a strategy to improve CIE and also used a collaborative leadership approach to dismantle silos and foster cross-agency collaboration. According to [Raynor et al. \(2017\)](#), lessons learned included (1) the CECY developed a set of strategies for policy and practice to improve employment for youth with I/DD, (2) members worked within their own agencies to influence state policy efforts by involving policy leaders in their efforts, (3) members built relationships that led to formal and informal collaborations, and (4) nontraditional partnerships facilitated networking opportunities and employment.

**Community conversations generated ideas and solutions that are grounded in local assets to expand CIE opportunities for people with I/DD.** Under the California PIE project, the CECY held community conversations with employers, educators, disability agency state administrators, local and state government officials, individuals with disabilities, and other community members in seven locales where CECY had recognized promising practices for transitioning youth and young adults with I/DD into employment and had achieved higher employment rates for young adults than what was being achieved at the state or national level for individuals with I/DD. [Raynor et al. \(2018\)](#) analyzed findings from community conversations with 431 community members and reported several recommended strategies: (1) to build partnerships with employers, joining coalitions, associations, and networks to engage civic, business, and disability leaders can create CIE opportunities for people with disabilities; (2) to build awareness and share resources for education and training, communicate and share successful employer-driven efforts to hire and retain people with disabilities with Chambers of Commerce, hiring managers, and others; (3) to prepare youth and young adults for the transition to work, expose youth with disabilities to careers and work experiences as early as possible; and (4) to help people with disabilities find jobs easily, simplify the application process by creating an accessible centralized database, individualizing the hiring process, and affording providers direct access to key personnel making hiring decisions.

**The New York PIE project spurred system changes through targeted technical assistance to support the state's planned shift to managed care, closure of Medicaid-funded sheltered workshops, and rate restructuring to incentivize supported employment services,** among other policy and programmatic changes. The New York PIE project sought to enhance cross-system collaboration in the state to promote Employment First goals and strengthen state capacity to develop policies and regulatory changes that promote CIE for people with I/DD. New York State PIE funding was leveraged to develop and implement a pilot initiative with 12 agencies that provided pre-vocational services in segregated workshop settings. These agencies received resources to assist in developing new business models in support of the shift to a community-based employment service system. The New York State PIE project also **offered the Certified Employment Specialist Professional exam to qualified individuals to increase job development and job coaching supports** across the state ([Christensen et al. 2017](#)). The New York State PIE project **piloted the expansion of their Employment Training Program, a career exploration service that provides stipends to high school students for trial work experiences.** A focus of the New York State PIE project was to also expand the number of Project SEARCH sites in the state, as discussed in Section A.1 of this chapter.



**Another study summarized findings from the Utah PIE project, which tested the Utah School-to-Work Initiative (USWI), a project model that combined customized employment services, work-based learning experiences, and inter-agency collaboration to support transition-age youth with I/DD and other disabilities to achieve positive employment outcomes ([Jones-Parkin et al. 2021](#)).**

The project built collaborative teams that provided critical supports for each individual to attain his or her identified goals. The collaborative team framework also **identified opportunities to braid services and funding for comprehensive**

**services to students with the most significant disabilities.** Salient lessons learned from USWI implementation included (1) family members held diverse views about their child’s ability to achieve CIE; (2) scarce resources were available for English language learners and non–U.S. citizens, who found navigating the services provided in the collaborative model challenging; and (3) high turnover and limited capacity among service providers to provide CE to project participants hindered implementation. In addition, transition coordinators demonstrated an aptitude to be effective leaders, whereas secondary education teachers struggled to proactively lead interagency teams because of demands on their time.

**The Wisconsin PIE project, known as Let’s Get to Work Wisconsin (LGTW), instituted policy changes to prioritize integrated employment for youth with disabilities.** The policies included changes to Managed Care Organizations’ contracts to emphasize integrated employment, passage of a pay for performance bill to incentivize school districts to foster positive post-school outcomes for youth with disabilities, and adding an on-the-job training service option for youth through the state VR agency. The LGTW project also partnered with 12 high schools to test evidence-based practices such as transition service coordination and paid work experiences to improve employment outcomes for high school youth (ages 15 to 17) who had been identified through the IEP process as having an intellectual disability, multiple disabilities, or ASD. A notable lesson to inform future efforts included scaling up project models ([Molfenter et al. 2017](#)). Specifically, **if school districts are to receive stipends to use evidence-based practices to encourage employment among students with I/DD, the LGTW project recommended less funding to start and increasing funding over time** to fully cover costs during full implementation.

*d. Other policy mechanisms implemented to promote CIE*

**Five states featured in a descriptive study implemented state policies and changed Medicaid payment structures to incentivize CIE,** according to a study conducted by [Denny-Brown et al. \(2013\)](#). For example, the District of Columbia set the reimbursement rate for employment services higher than facility-based services and factored time spent on job development and direct services into the supported employment rate. Minnesota gained legislative approval to unbundle its waiver rates, allowing for rate variations to capture differences in the intensity of services and Washington revised the payment structures in the Medicaid waiver programs to tie funding for employment supports to each individual’s support needs. To incentivize CIE, Kentucky increased the supported employment rate in its Supports for Community Living waiver for people with I/DD by nearly 100 percent and decreased day activity services rate by 11 percent; these changes took effect throughout 2014. In addition to modifying waiver

USWI collaborative team composition:

- Special educator team lead (local education agency/school district)
- VR counselor (state VR agency)
- Workforce Innovation and Opportunity Act youth counselor (Utah Department of Workforce Services)
- Employment specialist (local community rehabilitation provider)
- Support coordinator (state waiver program for people with I/DD)
- Pre-ETS provider (independent living centers)▲

payment rates, **these states also implemented other strategies to encourage CIE, such as toolkits to educate transition-age youth about the benefits of working (District of Columbia and Minnesota) and websites and disability linkage lines, a statewide resource hub, to inform and connect people with disabilities to resources about public benefits and work planning (Minnesota). States also instituted innovations to monitor the quality of services offered by providers.** For example, Kentucky tested a quality initiative that gives people receiving services the ability to rate the quality of all services they receive, including supported employment services, on a four-point scale; the data are aggregated and made publicly available.

**State support for promoting CIE; state adoption of Employment First policies; state policies allowing public benefits to continue while working; and the extent of federal support for 14(c) employment versus CIE, through funding and technical assistance, were the top public policy factors that may influence an individual’s transition from SWE to CIE.** A mixed-methods study that drew on a literature review, site visit interviews with 14(c) certificate holders, and interviews with experts and state officials identified 32 factors, organized into four categories—employee, employer, public policy, and local economy—that may directly or indirectly help or hinder an individual’s transition from SWE to CIE, depending on implementation and design ([Curda 2021](#)). Employee and employer factors that influence an individual’s ability to transition from SWE to CIE are described in Chapter V (that is, 14(c) certificate holder or provider-level intervention findings). In addition to public policy factors, the **local economy category includes four factors that relate to local economic and employment conditions, available employment services, and available transportation that can affect whether an individual remains in SWE or transitions to CIE.**



### 3. Other system interventions

Other system-level interventions capture state and local efforts to develop, pilot test, and evaluate capacity building initiatives and new service innovations to expand community integration and CIE among people with I/DD.

#### a. *Discovery certification program*

**The Florida VR agency implemented a pilot, in collaboration with the University of South Florida, Southeast Technical Assistance and Continuing Education Center, and Marc Gold & Associates, to test the feasibility of a Discovery certification program for CRPs who are VR vendors, to provide Discovery as a billable service.** Discovery is the first step in the customized employment process that uncovers an individual’s strengths, talents, and conditions for employment success ([Smith et al. 2015](#)). Under a pilot conducted to test the feasibility of a Discovery certification program for CRPs, the collaboration offered six-course modules online and on demand along with technical assistance and applied experience. To demonstrate knowledge acquisition, pilot participants successfully completed content module quizzes and applied Discovery practices with job seekers who were referred through VR. Trained experts provided mentoring and guidance throughout the class, and process checklists were used to ensure that the model was implemented with fidelity. Although the **pilot was successful (11 participants completed the training and became certified to provide Discovery as a billable service for VR), the model was not sustainable because of travel and training costs.** In addition, some participants could not complete the training due to demands on their time; high turnover among CRPs also posed challenges.

*b. Guided Group Discovery*

**Six school districts in Oregon piloted Guided Group Discovery (GGD) among students with disabilities who benefited from pre-ETS; participating students reported learning more about themselves, their own skills, and conditions for employment success.** They also understood the accommodations they needed and became familiar with the services and supports available from adult service agencies ([Salon et al. 2019](#)). The Salon et al. (2019) study explored approaches to scale GGD, which is an approach to CE in which the state VR agency, local school districts, CRPs, and American Job Centers collaborate and leverage pre-ETS funding to support youth and adults with I/DD to achieve employment. GGD provides a structure for coordinating transition services for high school students with I/DD that can be easily embedded within the framework of existing school classes, clubs, afterschool programs, and summer youth employment programs. GGD is intended to help match students with paid work and adult agencies that provide support in finding work that meets their support needs. **Developing a networking pitch, conducting informational interviews, and identifying their ideal conditions for employment were the most helpful aspects of GGD, according to students.** Staff working in the Youth Transition Program administered by the state VR agency that helped to facilitate the GGD curriculum reported that GGD is an “excellent platform” for discussing and conducting all activities in pre-ETS, with the exception of work-based learning experiences.



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## VI. Conclusions

This systematic evidence review sought to examine literature documenting interventions and strategies that help people working in SWE—or considering doing so—to succeed in CIE. Although the team began with a focus on individuals working in SWE or considering SWE, few articles arose from this search indicating the dearth of literature on this topic. As a result, to broaden the search strategy, we expanded the relevant population to people with disabilities. The systematic evidence review included studies with both youth and adult populations, but youth populations are more commonly the focus of the identified studies. Additionally, among the 72 total studies, 13 utilized an RCT or comparison group QED study design. The lack of rigorous evidence with a clear causal link between the intervention and impacts appears to be a gap for this research. Moreover, none of the experimental studies examined programs that focused on populations typically underserved. These findings underscore a need for more programs and evaluations involving adults as well as traditionally underserved populations, such as racial and ethnic minorities, those living in underserved areas, and people with complex or multiple disabilities.

Experimental study results documented in this report present impacts on employment outcomes at all intervention levels. The studies with high evidence ratings are concentrated among the person-level and system-level interventions. At the person-level, study designs with a high evidence rating found that virtual job interview programs have positive impacts on mock interview performance, with one study documenting an increase in achieving CIE (Strickland et al. 2013; Smith et al. 2014, 2021). At the systems-level, study designs with a high evidence rating primarily found no statistically significant changes in employment (Mann et al. 2021) or found mixed results (Klayman et al. 2019; Sevak et al. 2021).

Among descriptive studies, promising practices and pockets of excellence reflect all intervention levels. Person-level interventions included counseling to initiate a service or program interventions as well as SE and CE to encourage CIE achievement. Moreover, many person-level interventions used assistive technologies that positively impacted employment outcomes. For employer-level interventions, the articles identified characteristics of successfully transformed 14(c) certificate holders as well as implementation approaches to support other organizations transitioning their service models to CIE. Provider-level interventions focused on capacity-building efforts such as training service providers to better support CIE. The system-level interventions included Project SEARCH, the youth-based Transition and Customized Employment Project, and PIE Systems Change Projects.

Experimental and descriptive studies featured wraparound services and supports. For many studies, wraparound services acted as a supplemental component to the key service component of the intervention. Experimental and descriptive studies found promising practices from interventions focused on assistive technology, although the review did not find strong evidence as to their effectiveness. Prominent assistive technology interventions included handheld technology that offered cues and video-based and virtual reality-based interventions that provided training.

Given recent shifts in state and federal policy to end SWE and states' efforts to institute changes to promote CIE, additional evidence about interventions and strategies that positively impact employment and other outcomes for people with disabilities would benefit the field. Of key importance, policymakers and practitioners may need additional information to understand practical lessons to replicate, evaluate, and scale promising interventions. The SWTCIE demonstration provides opportunities to add to the evidence base to inform policymakers and practitioners in the field.

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## **Appendix A**

### **Database Search Strategy**

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The goal of the database search was to identify publications within electronic databases that meet our inclusion criteria without being overly broad. This approach avoided screening through an excessive volume of irrelevant publications. We developed the search terms listed in Exhibit A.1 in consultation with a professional librarian. The terms related to employment, the nature of the employment programs and services, and participants’ disability status. We limited the search to publication years from 2012 to the present. The search retrieved two groups of publications: (1) publications whose titles included at least one term from each of the three categories and (2) publications whose titles included at least one term from search number one and abstracts included at least one term from search numbers two and three.

**Exhibit A.1. Search strings used in the electronic database search**

Search number	Search string
1. (Employment search terms)	("Competitive integrated employment" OR (competitive[ti] AND integrat*[ti] AND employ*[ti]) OR ((subsidi*[ti] OR subminimum[ti] OR fair[ti]) and (pay[ti] OR wage*[ti] OR earn*[ti])) OR ((employ*[ti] OR job[ti] OR workplace[ti] OR workforce[ti] OR vocation*[ti] OR prevocation*[ti]) AND ((competitive[ti] AND integrat*[ti]) OR support*[ti])))
2. (Employment service search terms)	(certificate[tiab] OR waiver[tiab] OR centered[tiab] OR workshop[tiab] OR strateg*[tiab] OR approach*[tiab] OR implement*[tiab] OR program*[tiab] OR interven*[tiab] OR support*[tiab] OR training[tiab] OR train[tiab] OR apprentice*[tiab] OR intern*[tiab] OR agency[tiab] or subsidi*[tiab] OR system*[tiab] OR act[tiab] OR legislat*[tiab] OR ballot[tiab] OR bill[tiab] or regulat*[tiab] OR facilit*[tiab] OR project*[tiab] OR integrat*[tiab] OR rehabili*[tiab] OR model*[tiab] OR center*[tiab] OR funding[tiab] OR innovate*[tiab] OR plan[tiab] OR planning[tiab] OR toolkit*[tiab] OR center*[tiab] OR vocation*[tiab] OR service*[tiab] OR initiativ*[tiab] OR campaign*[tiab] OR "place-then-train" OR habilitat*[tiab] OR facilit*[tiab] OR workshop*[tiab] OR piecework[tiab] OR community-based[tiab] OR "14c"[tiab] OR "14(c)"[tiab])
3. (Disability status search terms)	((disabilit* OR disabled OR disorder OR "cerebral palsy" OR "Downs syndrome" OR Autism OR autistic OR youth OR young) AND ((Mental[tiab] OR cognitive[tiab] OR cognition[tiab] OR development*[tiab] OR intellect*[tiab] OR understanding[tiab] OR learning[tiab] OR memory[tiab] OR memories[tiab] OR physical[tiab] OR physiolog*[tiab] OR mobilit*[tiab] OR amnesic[tiab] OR amnesia[tiab] OR remembering[tiab] OR communicat*[tiab] OR thinking[tiab] OR movement[tiab] OR motor[tiab] OR vision[tiab] OR visual*[tiab] OR sight[tiab] OR hearing[tiab] OR auditory[tiab] OR sensory[tiab] OR senses[tiab] OR speech[tiab] OR genetic[tiab] age-related[tiab] OR mental[tiab] OR stroke[tiab] OR ((head[tiab] OR brain[tiab]) AND (injur*[tiab] OR damage[tiab])) OR self-care[tiab] OR (chronic[tiab] AND (disease[tiab] OR illness[tiab])) OR behav*[tiab] OR language[tiab] OR "IDD") AND (deteriorat*[tiab] OR impair*[tiab] OR dysfunction*[tiab] OR disorder*[tiab] OR disrupt*[tiab] OR declin*[tiab] OR disabilit*[tiab] OR disabled[tiab] OR disorder*[tiab] OR limitation*[tiab] OR limited[tiab] OR restrict*[tiab] OR deficit[tiab] OR deficien*[tiab] OR differently-abled[tiab] OR difficult*[tiab] OR barrier*[tiab])))

ti = title; tiab = title or abstract. \* indicates truncation in literature search databases. This search technique efficiently searches for all forms of the word that share the given root. For example, “vocation\*” will return “vocation plan,” “vocation goal,” and “vocational training.”



We conducted the search in nine electronic databases:

1. EBSCO EconLit
2. EBSCO Academic Search Premier
3. EBSCO Health Policy
4. EBSCO Business Source
5. EBSCO SocIndex
6. EBSCO E- Journals
7. Elsevier- Scopus
8. PubMed
9. SAGE

## **Appendix B**

### **Publications Reviewed**

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Exhibit B.1 lists the 72 publications that met all inclusion criteria and were reviewed for this report, organized by intervention type (person-level, 14(c) certificate holder or provider-level, and system-level).

**Exhibit B.1. Publications that met all inclusion criteria, the intervention described, and research design**

Citation	Intervention described	Research design
<b>Person-level interventions</b>		
Allen, K.D., R.V. Burke, M.R. Howard, D.P. Wallace, and S.L. Bowen. "Use of Audio Cuing to Expand Employment Opportunities for Adolescents with Autism Spectrum Disorders and Intellectual Disabilities." <i>Journal of Autism and Developmental Disorders</i> , vol. 42, no. 11, 2012, pp. 2410–2419.	Video modeling and audio cuing using assistive technology	Descriptive, interrupted time series design
Austin, B.S., A. Fleming, C.L. Lee, and S. Pi. "Vocational Rehabilitation Outcomes for Individuals with Intellectual Disabilities and Co-Occurring Psychiatric Disorders." <i>Journal of Rehabilitation</i> , vol. 85, no. 4, October–December 2019, pp. 14–23. <a href="https://search.proquest.com/openview/ebd2c2b457792ef4b1502fd89e77b51/1?pq-origsite=gscholar&amp;cbl=37110">https://search.proquest.com/openview/ebd2c2b457792ef4b1502fd89e77b51/1?pq-origsite=gscholar&amp;cbl=37110</a> .	Vocational rehabilitation services	Descriptive study using structural equation modeling
Avellone, L., J. Camden, J. Taylor, and P. Wehman. "Employment Outcomes for Students with Intellectual Disabilities in Postsecondary Education Programs: A Scoping Review." <i>Journal of Postsecondary Education and Disability</i> , vol. 34, no. 3, 2021, pp. 223–238. <a href="https://eric.ed.gov/?id=EJ1325428">https://eric.ed.gov/?id=EJ1325428</a> .	Literature review	Literature review
Baker-Ericzén, M.J., M.A. Fitch, M. Kinnear, M. Jenkins, E. Twamley, L. Smith, G. Montano, J. Feder, P.J. Croke, M.G. Winner, and J. Leon. "Development of the Supported Employment, Comprehensive Cognitive Enhancement, and Social Skills Program for Adults on the Autism Spectrum: Results of Initial Study." <i>Autism: The International Journal of Research &amp; Practice</i> , vol. 22, no. 1, 2018, pp. 6–19. <a href="https://journals.sagepub.com/doi/pdf/10.1177/1362361317724294">https://journals.sagepub.com/doi/pdf/10.1177/1362361317724294</a> .	Soft-skills curriculum	Descriptive study
Barnard-Brak, L., D.M. Richman, K. Mutua, and A. Williamson. "Predictors of Employment for Adults with Intellectual and Developmental Disabilities Participating in a Postsecondary Transition Program in the United States." <i>Journal of Applied Research in Intellectual Disabilities</i> , vol. 36, no. 1, January 2023, pp. 116–121.	Crossing Points: a multi-tiered, inclusive postsecondary education transition to community employment program	Descriptive study
Brady, M.P., K.B. Kearney, A. Downey, A. Torres, and D. McDougall. "Using Mnemonics, Remote Coaching, and the Range-Bound Changing Criterion Design to Teach College Students with IDD to Make Employment Decisions." <i>Education and Training in Autism and Developmental Disabilities</i> , vol. 57, no. 3, 2022, pp. 303–319. <a href="https://eric.ed.gov/?id=EJ1357369">https://eric.ed.gov/?id=EJ1357369</a> .	Inclusive postsecondary education program	Descriptive study

Appendix B Publications reviewed

Citation	Intervention described	Research design
Brooke, V., A.M. Schall, C. Schall, P. Wehman, J. McDonough, K. Thompson, and J. Smith. "Employees with Autism Spectrum Disorder Achieving Long-Term Employment Success: A Retrospective Review of Employment Retention and Intervention." <i>Research and Practice for Persons with Severe Disabilities</i> , vol. 43, no. 3, September 2018, pp. 181–193.	Supported customized employment	Descriptive study; retrospective review of data
Bumble, J.L., E.W. Carter, E.D. McMillan, and A.S. Manikas. "Using Community Conversations to Expand Employment Opportunities of People with Disabilities in Rural and Urban Communities." <i>Journal of Vocational Rehabilitation</i> , vol. 47, no. 1, August 2017, pp. 65–78.	Community conversation events as part of employment outreach efforts	Descriptive study; mixed-methods approach
Carter, E.W., D. Austin, and A.A. Trainor. "Predictors of Postschool Employment Outcomes for Young Adults with Severe Disabilities." <i>Journal of Disability Policy Studies</i> , vol. 23, no. 1, 2012, pp. 50–63.	On-the-job support	Descriptive study
Chan, F., P. Rumrill, P. Wehman, K. Iwanaga, J. R. Wu, S. Rumrill, and B. Lee. "Effects of Postsecondary Education on Employment Outcomes and Earnings of Young Adults with Traumatic Brain Injuries." <i>Journal of Vocational Rehabilitation</i> , vol. 53, no. 2, August 2020, pp. 1–8.	Vocational rehabilitation services	Descriptive study; comparative study using propensity score matching
Chan, F., T.N., Tansey, K. Iwanaga, J. Bezyak, P. Wehman, B.N. Phillips, D. Strauser, and C. Anderson. "Company Characteristics, Disability Inclusion Practices, and Employment of People with Disabilities in the Post COVID-19 Job Economy: A Cross Sectional Survey Study." <i>Journal of Occupational Rehabilitation</i> , vol. 31, no. 1, 2021, pp. 463–473. <a href="https://link.springer.com/article/10.1007/s10926-020-09941-8">https://link.springer.com/article/10.1007/s10926-020-09941-8</a> .	Investigate company characteristics and effective disability inclusion practices	Descriptive study; cross sectional survey study
Davies, D.K., S.E. Stock, C.D. Davies, and M.L. Wehmeyer. "A Cloud-Supported App for Providing Self-Directed, Localized Job Interest Assessment and Analysis for People with Intellectual Disability." <i>Advances in Neurodevelopmental Disorders</i> , vol. 2, no. 2, March 2018, pp. 199–205. <a href="https://link.springer.com/article/10.1007/s41252-018-0062-8">https://link.springer.com/article/10.1007/s41252-018-0062-8</a> .	Assistive technology	Descriptive study
Gentry, T., S. Lau, A. Molinelli, A. Fallen, and R. Kriner. "The Apple iPod Touch as a Vocational Support Aid for Adults with Autism: Three Case Studies." <i>Journal of Vocational Rehabilitation</i> , vol. 37, no. 2, 2012, pp. 75–85. DOI: 10.3233/JVR-2012-0601.	Assistive technology	Descriptive study; case studies
Gilson, C.B., and E.W. Carter. "Promoting Social Interactions and Job Independence for College Students with Autism or Intellectual Disability: A Pilot Study." <i>Journal of Autism and Developmental Disorders</i> , vol. 46, no. 11, August 2016, pp. 3583–3596. <a href="https://link.springer.com/article/10.1007/s10803-016-2894-2">https://link.springer.com/article/10.1007/s10803-016-2894-2</a> .	Job coaching intervention	Descriptive study; single case experimental design
Hill, D.A., L. Belcher, H.E. Brigman, S. Renner, and B. Stephens. "The Apple iPad™ as an Innovative Employment Support for Young Adults with Autism Spectrum Disorder and Other Developmental Disabilities." <i>Journal of Applied Rehabilitation Counseling</i> , vol. 44, no. 1, March 2013, pp. 28–37. DOI: 10.1891/0047-2220.44.1.28.	Assistive technology	Descriptive study; case studies
Kaya, C., C. Hanley-Maxwell, F. Chan, and T. Tansey. "Differential Vocational Rehabilitation Service Patterns and Outcomes for Transition-Age Youth with Autism." <i>Journal of Applied Research in Intellectual Disabilities</i> , vol. 31, no. 5, February 2018, pp. 862–872.	VR services, including job placement, on-the-job supports	Descriptive; quantitative correlational design

Appendix B Publications reviewed

Citation	Intervention described	Research design
Mann, D., K. Feeney, T. Honeycutt, and M. Luhr. "Way2Work Maryland Demonstration: Impacts 24 Months After Enrollment." <i>Mathematica</i> , June 30, 2021. <a href="https://www.mathematica.org/publications/way2work-maryland-demonstration-impacts-24-months-after-enrollment">https://www.mathematica.org/publications/way2work-maryland-demonstration-impacts-24-months-after-enrollment</a> .	Work-based learning experience	RCT
Mazzotti, V.L., A. Kittelman, K.W. Bromley, and K.A. Hirano. "Experimental Analysis of Multi-Component Intervention to Support Youth in Integrated Work Settings." <i>Journal of Vocational Rehabilitation</i> , vol. 53, no. 2, August 2020, pp. 145–158.	Assistive technology	Descriptive study
Miller, S.C., M.S. Tucker, and C.L. Sax. "Examining Associations Between Postsecondary Education, Earnings, and Provision of College and University Training Related to Individuals with Intellectual and Developmental Disabilities Served by Vocational Rehabilitation." <i>Journal of Rehabilitation</i> , vol. 85, no.1, 2019, pp. 22–34. <a href="https://www.proquest.com/docview/2195113010?pq-origsite=primo">https://www.proquest.com/docview/2195113010?pq-origsite=primo</a> .	VR services focused on postsecondary education support	Descriptive study
Muharib, R., K. Ledbetter-Cho, L. Ann-Bross, R. Lang, M.D. Hinson, and R.K. Cilek. "Handheld Technology to Support Vocational Skills of Individuals with Intellectual and Developmental Disabilities in Authentic Settings: A Systematic Review." <i>Journal of Autism and Developmental Disorders</i> , vol. 9, no. 1, 2022, pp. 108–119. <a href="https://link.springer.com/article/10.1007/s40489-021-00247-w">https://link.springer.com/article/10.1007/s40489-021-00247-w</a> .	Assistive technology	Literature review
Munandar, V.D., M.E. Morningstar, and S.R. Carlson. "A Systematic Literature Review of Video-Based Interventions to Improve Integrated Competitive Employment Skills Among Youth and Adults with Autism Spectrum Disorder." <i>Journal of Vocational Rehabilitation</i> vol. 53, no.1, June 2020, pp. 29–41.	Video-based interventions	Literature review
Myers, C., and C. Cox. "Work Motivation Perceptions of Students with Intellectual Disabilities Before and After Participation in a Short-Term Vocational Rehabilitation Summer Programme: An Exploratory Study." <i>Journal of Applied Research in Intellectual Disabilities</i> , vol. 33, February 2020, no. 5, pp. 898–904.	Six-week summer vocational program	Descriptive study; dyadic interviewing and questionnaires
Paul, C.D., E.V. Thomas, C. Marelle, S.Z. Hussain, A.M. Doulin, and E. Jimenez. "Using Wireless Technology to Support Individuals with Intellectual and Developmental Disabilities in Vocational Settings: A Focus Group Study." <i>Journal of Vocational Rehabilitation</i> , vol. 56, no. 3, 2022, pp. 303–312.	Assistive technology	Descriptive study; focus groups
Qian, X., C. Papay, P. Chaxiong, and D.R. Johnson. "Literature Review of Employment Outcomes for Adults with Intellectual and Developmental Disability." <i>International Review of Research in Developmental Disabilities</i> , vol. 55, 2018, pp. 213–266.	Job coaching and mentorship	Literature review
Schutz, M.A., B. Schwartzman, J.M. Awsumb, L. Burgess, E.W. Carter, and J.L. Taylor. "Pathways to Paid Work for Youth with Severe Disabilities: Perspectives on Strategies for Success." <i>Journal of Vocational Rehabilitation</i> , vol. 58, 2023, pp. 11–26. <a href="https://content.iospress.com/articles/journal-of-vocational-rehabilitation/jvr221221">https://content.iospress.com/articles/journal-of-vocational-rehabilitation/jvr221221</a> .	Career plan development; community-based work experiences	Descriptive study

Appendix B Publications reviewed

Citation	Intervention described	Research design
Sevak, P., N. Denny-Brown, and M. Shenk. "Customized Employment: Translating Policy Into Practice Through SourceAmerica Pathways to Careers." <i>Mathematica</i> , August 2019. <a href="https://www.mathematica.org/publications/customized-employment-translating-policy-into-practice-through-sourceamerica-pathways-to-careers">https://www.mathematica.org/publications/customized-employment-translating-policy-into-practice-through-sourceamerica-pathways-to-careers</a> .	Pathways program: customized employment model	Descriptive study
Sevak, P., K. Feeney, T. Honeycutt, and E. Peterson. "Vermont's Linking Learning to Careers Demonstration: Impacts 24 Months After Enrollment." <i>Mathematica</i> , August 2021. <a href="https://www.mathematica.org/publications/linking-learning-to-careers-demonstration-impacts-24-months-after-enrollment">https://www.mathematica.org/publications/linking-learning-to-careers-demonstration-impacts-24-months-after-enrollment</a> .	Work-based learning experience	RCT
Smith, M.J., E.J. Ginger, K. Wright, M.A. Wright, J.L. Taylor, L.B. Humm, D.E. Olsen, M.D. Bell, and M.F. Fleming. "Virtual Reality Job Interview Training in Adults with Autism Spectrum Disorder." <i>Journal of Autism and Developmental Disorders</i> , vol. 44, no. 10, 2014, pp. 2450–2463. <a href="https://link.springer.com/article/10.1007/s10803-014-2113-y">https://link.springer.com/article/10.1007/s10803-014-2113-y</a> .	Virtual Reality Job Interview Training	RCT
Smith, M.J., M.F. Fleming, M.A. Wright, M. Losh, L.B. Humm, D. Olsen, and M.D. Bell. "Brief Report: Vocational Outcomes for Young Adults with Autism Spectrum Disorders at Six Months After Virtual Reality Job Interview Training." <i>Journal of Autism and Developmental Disorders</i> , vol. 10, 2015a, pp. 3364–3369. <a href="https://link.springer.com/article/10.1007/s10803-015-2470-1">https://link.springer.com/article/10.1007/s10803-015-2470-1</a> .	Virtual Interview Training for Transition Age Youth	RCT
Smith, M.J., K. Sherwood, B. Ross, J.D. Smith, L. DaWalt, L. Bishop, L. Humm, J. Elkins, and C. Steacy. "Virtual Interview Training for Autistic Transition Age Youth: A Randomized Controlled Feasibility and Effectiveness Trial." <i>Autism</i> , vol. 25, no. 6, 2021, pp. 1536–1552. <a href="https://journals.sagepub.com/doi/pdf/10.1177/1362361321989928">https://journals.sagepub.com/doi/pdf/10.1177/1362361321989928</a> .	Virtual Interview Training for Transition Age Youth	RCT
Southward, J.D., and K. Kyzar. "Predictors of Competitive Employment for Students with Intellectual and/or Developmental Disabilities." <i>Education and Training in Autism and Developmental Disabilities</i> , vol. 52, no. 1, March 2017, pp. 26–37. <a href="https://www.jstor.org/stable/26420373">https://www.jstor.org/stable/26420373</a> .	Transition-related activities	Literature review
Strickland, D.C., C.D. Coles, and L.B. Southern. "JobTIPS: A Transition to Employment Program for Individuals with Autism Spectrum Disorders." <i>Journal of Autism and Developmental Disorders</i> , vol. 43, no. 10, March 2013, pp. 2472–2483. <a href="https://link.springer.com/article/10.1007/s10803-013-1800-4">https://link.springer.com/article/10.1007/s10803-013-1800-4</a> .	JobTIPS multimedia employment training program	RCT
Sung, C., A. Connor, J. Chen, C-C. Lin, H-J. Kuo, and J. Chun. "Development, Feasibility, and Preliminary Efficacy of an Employment-Related Social Skills Intervention for Young Adults with High-Functioning Autism." <i>Autism</i> , vol. 23, no. 6, 2019, pp. 1542–1553. <a href="https://journals.sagepub.com/doi/pdf/10.1177/1362361318801345">https://journals.sagepub.com/doi/pdf/10.1177/1362361318801345</a> .	Soft-skills curriculum called Assistive Soft Skills and Employment Training	Descriptive study
Taylor, J., L. Avellone, V. Brooke, P. Wehman, K. Inge, C. Schall, and K. Iwanaga. "The Impact of Competitive Integrated Employment on Economic, Psychological, and Physical Health Outcomes for Individuals with Intellectual and Developmental Disabilities." <i>Journal of Applied Research in Intellectual Disabilities</i> , 2022, pp. 1–12.	Association between CIE and improved outcomes.	Literature review



Citation	Intervention described	Research design
Ward, D.M., and M.C.K. Esposito. "Virtual Reality in Transition Program for Adults with Autism: Self-Efficacy, Confidence, and Interview Skills." <i>Contemporary School Psychology</i> , vol. 23, no. 4, 2019, pp. 423–431. <a href="https://link.springer.com/article/10.1007/s40688-018-0195-9">https://link.springer.com/article/10.1007/s40688-018-0195-9</a> .	Virtual Reality Job Interview Training Program	Descriptive study
Wehman, P., S. Lau, A. Molinelli, V. Brooke, K. Thompson, C. Moore, and M. West. "Supported Employment for Young Adults with Autism Spectrum Disorder: Preliminary Data." <i>Research and Practice for Persons with Severe Disabilities</i> , vol. 37, no. 3, 2012, pp.160–169. <a href="https://journals.sagepub.com/doi/pdf/10.2511/027494812804153606">https://journals.sagepub.com/doi/pdf/10.2511/027494812804153606</a> .	SE	Descriptive study; prospective study
Wehman, P., F. Chan, N. Ditchman, and H.-J. Kang. "Effect of Supported Employment on Vocational Rehabilitation Outcomes of Transition-Age Youth with Intellectual and Developmental D: A Case Control Study." <i>Intellectual and Developmental Disabilities</i> , vol. 52, no. 4, 2014, pp. 296–310.	SE	Descriptive study; propensity score matching; CART method
Wehman, P., V. Brooke, A. Molinelli Brooke, W. Ham, C. Schall, J. McDonough, S. Lau, H. Seward, and L. Avellone. "Employment for Adults with Autism Spectrum Disorders: A Retrospective Review of a Customized Employment Approach." <i>Research in Developmental Disabilities</i> , vol. 53–54, June–July 2016, pp. 61–72.	SE	Descriptive study; retrospective records
<b>14(c) certificate holder or provider-level interventions</b>		
Butterworth, J., A. Migliore, K. Nye-Lengerman, O. Lyons, A. Gunty, J. Eastman, and P. Foos. "Using Data-Enabled Performance Feedback and Guidance to Assist Employment Consultants in Their Work with Job Seekers: An Experimental Study." <i>Journal of Vocational Rehabilitation</i> , vol. 53, no. 2, 2020, pp. 189–203.	Assistive technology	RCT
Gilson, C.B., C. Thompson, K. Ingles, K. Stein, N. Wang, and M. Nygaard. "The Job Coaching Academy for Transition Educators: A Preliminary Evaluation." <i>Career Development and Transition for Exceptional Individuals</i> , vol. 44, no.3, 2021, pp.148–160. <a href="https://link.springer.com/article/10.1007/s10803-016-2894-2">https://link.springer.com/article/10.1007/s10803-016-2894-2</a> .	Job Coaching Academy	Comparison group QED
Kamau, E., and J. Timmons. "Bringing Employment First to Scale: A Roadmap to Competitive Integrated Employment: Strategies for Provider Transformation." <i>Rehabilitation Research on Advancing Employment</i> , no. 20, 2018. <a href="https://eric.ed.gov/?id=ED603602">https://eric.ed.gov/?id=ED603602</a> .	Organizational transformation	Descriptive study; case studies
Kim, S.Y. "Understanding Perspectives of Job Coaches of Supported Employment Programs Working with Adults with Autism." <i>International Journal of Disability, Development &amp; Education</i> , October 2022, pp. 1–18.	Investigate the perspectives of job coaches	Descriptive study; interviews with job coaches
Lyons, O., J. Timmons, A. Cohen-Hall, and S. LeBlais. "The Essential Characteristics of Successful Organizational Transformation: Findings from a Delphi Panel of Experts." <i>Journal of Vocational Rehabilitation</i> , vol. 49, 2018, pp. 205–216.	Ten elements necessary for organizational transformation	Descriptive study; Delphi panel

Citation	Intervention described	Research design
Lyons, O., J. Timmons, A. Hall, L. Enein-Donovan, and E. Kamau. "The Benefits of Active, Person-Centered Job Placement: Results from Service Providers Undergoing Organizational Transformation Away from Sheltered Employment." <i>Intellectual and Developmental Disabilities</i> , vol. 60, no. 3, May 2022, pp. 234–245. <a href="https://meridian.allenpress.com/idd/article-abstract/60/3/234/482303">https://meridian.allenpress.com/idd/article-abstract/60/3/234/482303</a> .	Person-centered job placement TA pilot	Descriptive study; case study
Migliore, A., J. Butterworth, and K. Nye-Lengerman. "Rethinking Management Information Systems for Scaling Up Employment Outcomes." <i>Journal of Disability Policy Studies</i> , vol. 33, no. 2, 2022, pp. 133–142.	Innovation in use of management information systems	Descriptive study
Smith, T.J., D. Ching, A. Weston, and C.J. Dillahunt-Aspillaga. "Achieving Competitive, Customized Employment Through Specialized Services (ACCESS)." <i>Journal of Vocational Rehabilitation</i> , vol. 50, no. 3, May 2019, pp. 249–258.	Achieving Competitive, Customized Employment Through Specialized Services	Descriptive study
Taylor, J.P., L. Avellone, P. Wehman, and V. Brooke. "The Efficacy of Competitive Integrated Employment Versus Segregated Employment for Persons with Disabilities: A Systematic Review." <i>Journal of Vocational Rehabilitation</i> , vol. 58, no. 1, January 2023, pp. 63–78. <a href="https://content.iospress.com/articles/journal-of-vocational-rehabilitation/jvr221225">https://content.iospress.com/articles/journal-of-vocational-rehabilitation/jvr221225</a> .	Compares separated employment with integrated employment	Literature review
Timmons, J.C., E. Kamau, O. Lyons, and L. Enein-Donovan. "Provider Strategies on Ten Elements of Organizational Transformation." <i>Journal of Vocational Rehabilitation</i> , vol. 50, no. 3, May 2019, pp. 307–316.	TA for organizational transformation	Descriptive study; case study
<b>System-level interventions</b>		
Almalki, S. "A Qualitative Study of Supported Employment Practices in Project SEARCH." <i>International Journal of Developmental Disabilities</i> , vol. 67, no. 2, June 2019, pp. 140–150.	Project SEARCH	Descriptive study; interviews
Butterworth, J., J. Christensen, and K. Flippo. "Partnerships in Employment: Building Strong Coalitions to Facilitate Systems Change for Youth and Young Adults." <i>Journal of Vocational Rehabilitation</i> , vol. 47, no. 3, December 2017, pp. 265–276.	Partners in Employment	Descriptive study
Christensen, J.J., S. Hetherington, M. Daston, and E. Riehle. "Longitudinal Outcomes of Project SEARCH in Upstate New York." <i>Journal of Vocational Rehabilitation</i> , vol. 42, no. 3, 2015, pp. 247–255. <a href="https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/strong-center-developmental-disabilities/documents/2015-Longitudinal-Outcomes.PDF">https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/strong-center-developmental-disabilities/documents/2015-Longitudinal-Outcomes.PDF</a> .	Partners in Employment	Descriptive study
Curda, E. "Subminimum Wage Program Factors Influencing the Transition of Individuals with Disabilities to Competitive Integrated Employment." U.S. Government Accountability Office, March 2021. <a href="https://www.gao.gov/assets/gao-21-260.pdf">https://www.gao.gov/assets/gao-21-260.pdf</a> .	Investigate program factors for transition to CIE	Literature review
Denny-Brown, N., L. Guanga, and D. Sehgal. "Lessons Learned from States' Efforts to Transform Their Employment Service Systems for People with Intellectual Developmental Disabilities." Mathematica, 2013. <a href="https://econpapers.repec.org/paper/mpmmpres/837d270948cb43f9a3a3bd2fb2907e30.htm">https://econpapers.repec.org/paper/mpmmpres/837d270948cb43f9a3a3bd2fb2907e30.htm</a> .	State TA to promote integrated employment	Descriptive study

Appendix B Publications reviewed

Citation	Intervention described	Research design
Friedman, C., and M.C. Rizzolo. “Get Us Real Jobs:’ Supported Employment Services for People with Intellectual and Developmental Disabilities in Medicaid Home and Community Based Services Waivers.” <i>Journal of Vocational Rehabilitation</i> , vol. 46, no. 1, January 2017, pp. 107–116.	Analysis of Medicaid HCBS waivers	Descriptive study
Ham, W., J. McDonough, A. Molinelli, C. Schall, and P. Wehman. “Employment Supports for Young Adults with Autism Spectrum Disorder: Two Case Studies.” <i>Journal of Vocational Rehabilitation</i> , vol. 40, no. 2, February 2014, pp. 117–124.	Project SEARCH plus ASD	Descriptive study
Houseworth, J., S.L. Pettingell, R.J. Stancliffe, J. Bershadsky, R., Tichá, and A. Zhang. “Community Employment, Facility-Based Work, and Day Activities for Working Age People with Intellectual and Developmental Disability.” <i>Journal of Vocational Rehabilitation</i> , vol. 57, no. 1, July 2022, pp. 97–112.	Prevalence of employment activities	Descriptive study
Jones-Parkin, T. “Employment First and Transition: Utah School-To-Work Initiative.” <i>Journal of Vocational Rehabilitation</i> , vol. 54, no. 3, May 2021, pp. 265–271.	Partnerships in Integrated Employment	Descriptive study
Klayman, D., C. DiBiase, A. Searson, H. Hock, and T. Ketema. “Disability Employment Impact Evaluation: Round 1 Through Round 4 Grantees.” U.S. Department of Labor, March 2019. <a href="https://www.dol.gov/sites/dolgov/files/odep/topics/completedei1-4report.pdf">https://www.dol.gov/sites/dolgov/files/odep/topics/completedei1-4report.pdf</a> .	Disability Employment Initiative	RCT
Molfenter, N.F., E. Hartman, J. Neugart, and S. Webb. “Let’s Get to Work Wisconsin: Launching Youth with Intellectual and Developmental Disabilities into the Workforce.” <i>Journal of Vocational Rehabilitation</i> , vol. 47, no. 3, 2017, pp. 379–390.	Wisconsin’s Let’s Get to Work	Descriptive study; survey and focus groups
National Council on Disability. “Policies from the Past in a Modern Era: The Unintended Consequences of the AbilityOne Program & Section 14(c).” National Council on Disability, October 2020. <a href="https://ncd.gov/publications/2020/policies-past-modern-era">https://ncd.gov/publications/2020/policies-past-modern-era</a> .	AbilityOne program	Descriptive study; interviews; site visits
Nye-Lengerman, K. “Vocational Rehabilitation Service Usage and Outcomes for Individuals with Autism Spectrum Disorder.” <i>Research in Autism Spectrum Disorders</i> , vol. 41, no. 1, 2017, pp. 39–50.	VR services	Descriptive study; secondary data analysis
Raynor, O., K. Hayward, and K. Rice. “CECY: California’s Collaborative Approach to Increasing Employment of Youth and Young Adults with Intellectual Disabilities.” <i>Journal of Vocational Rehabilitation</i> , vol. 47, no. 3, 2017, pp. 307–316.	California Employment Consortium	Descriptive study
Raynor, O., K. Hayward, G. Semenza, and B. Stoffmacher. “Community Conversations to Increase Employment Opportunities for Young Adults with Developmental Disabilities in California.” <i>Journal of Disability Policy Studies</i> , vol. 28, no. 4, 2018, pp. 203–215. <a href="https://journals.sagepub.com/doi/pdf/10.1177/1044207317739405">https://journals.sagepub.com/doi/pdf/10.1177/1044207317739405</a> .	California Employment Consortium	Descriptive study; community conversations
Roux, A.M., J.E. Rast, K.A. Anderson, E. Garfield, and P.T. Shattuck. “Vocational Rehabilitation Service Utilization and Employment Outcomes Among Secondary Students on the Autism Spectrum.” <i>Journal of Autism and Developmental Disorders</i> , vol. 51, no. 1, 2021, pp. 212–226. <a href="https://link.springer.com/article/10.1007/s10803-020-04533-0">https://link.springer.com/article/10.1007/s10803-020-04533-0</a> .	VR services	Descriptive study

Appendix B Publications reviewed

Citation	Intervention described	Research design
Salon, R.S., N. Boutot, K. Ozols, B. Keeton, and J. Steveley. "New Approaches to Customized Employment: Enhancing Cross-System Partnerships." <i>Journal of Vocational Rehabilitation</i> , vol. 50, no. 3, 2019, pp. 317–323.	Guided Group Discovery and using Pre-ETS	Descriptive study
Schall, C., P. Wehman, L. Avellone, and J.P. Taylor. "Competitive Integrated Employment for Youth and Adults with Autism: Findings from a Scoping Review." <i>Child Adolescent and Psychiatric Clinics of North America</i> , 2020.	Impacts of a range of programs	Literature review
Schall, C., A.P. Sima, L. Avellone, P. Wehman, J. McDonough, and A. Brown. "The Effect of Business Internships Model and Employment on Enhancing the Independence of Young Adults with Significant Impact from Autism." <i>Intellectual and Developmental Disabilities</i> , vol. 58, no. 4, 2020a, pp. 301–313. <a href="https://meridian.allenpress.com/idd/article-abstract/58/4/301/441697">https://meridian.allenpress.com/idd/article-abstract/58/4/301/441697</a> .	Project SEARCH plus ASD	RCT
Smith, T.J., C. Dillahunt-Aspillaga, and C. Kenney. "Integrating Customized Employment Practices Within the Vocational Rehabilitation System." <i>Journal of Vocational Rehabilitation</i> , vol. 42, no. 3, 2015, 201–208. <a href="https://content.iospress.com/articles/journal-of-vocational-rehabilitation/jvr0740">https://content.iospress.com/articles/journal-of-vocational-rehabilitation/jvr0740</a> .	Alternative to standard VR services	Descriptive study; comparing pre- and post-test responses
Tucker, K., H. Feng, C. Gruman, and L. Crossen. "Improving Competitive Integrated Employment for Youth and Young Adults with Disabilities: Findings from an Evaluation of Eight Partnerships in Employment Systems Change Projects." <i>Journal of Vocational Rehabilitation</i> , vol. 47, no. 3, December 2017, pp. 277–294.	Partnerships in Employment	Descriptive study; mixed methods
Wehman, P.H., C.M. Schall, J. McDonough, J. Kregel, V. Brooke, A. Molinelli, W. Ham, C.W. Graham, J.E. Riehle, H.T. Collins, and W. Thiss. "Competitive Employment for Youth with Autism Spectrum Disorders: Early Results from a Randomized Clinical Trial." <i>Journal of Autism and Developmental Disorders</i> , vol. 44, no. 3, 2014a, pp. 487–500. <a href="https://link.springer.com/article/10.1007/s10803-013-1892-x">https://link.springer.com/article/10.1007/s10803-013-1892-x</a> .	Project SEARCH plus ASD	RCT
Wehman, P., C.M. Schall, J. McDonough, C. Graham, V. Brooke, J.E., Riehle, A. Brooke, W. Ham, S. Lau, J. Allen, and L. Avellone. "Effects of an Employer-Based Intervention on Employment Outcomes for Youth with Significant Support Needs Due to Autism." <i>Autism</i> , vol. 21, no. 3, 2017, pp. 276–290. <a href="https://journals.sagepub.com/doi/pdf/10.1177/1362361316635826">https://journals.sagepub.com/doi/pdf/10.1177/1362361316635826</a> .	Project SEARCH plus ASD	RCT
Wehman, P., C. Schall, J. McDonough, A. Sima, A. Brooke, W. Ham, H. Whittenburg, V. Brooke, L. Avellone, and E. Riehle. "Competitive Employment for Transition-Aged Youth with Significant Impact from Autism: A Multi-site Randomized Clinical Trial." <i>Journal of Autism and Developmental Disorders</i> , vol. 50, no. 6, 2020, pp. 1882–1897. <a href="https://link.springer.com/article/10.1007/s10803-019-03940-2">https://link.springer.com/article/10.1007/s10803-019-03940-2</a> .	Project SEARCH plus ASD	RCT

Note: This table is inclusive of all reviewed studies that met the inclusion criteria. Not every study included in this table is included in the text of the report.

ASD = autism spectrum disorder; CART = classification and regression tree; CIE = competitive integrated employment; HCBS = home and community based services; IDD = intellectual and developmental disability; pre-ETS = pre-employment transition services; QED = quasi-experimental design; RCT = randomized control trial; TA = technical assistance; VR = vocational rehabilitation.

## **Appendix C**

### **Experimental Study Results and Ratings**

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Exhibits presented in this appendix provide additional details about the experimental studies. Exhibit C.1 includes sample descriptions and employment outcomes for each experimental study organized by evidence rating. Exhibit C.2 provides details about the assignment for each experimental study’s evidence rating.

**Exhibit C.1. Employment outcome results and sample descriptions for all eligible experimental studies, by evidence rating**

Sample description	Employment outcomes	Direction
<b>High evidence rating RCTs</b>		
<b>Disability Employment Initiative (Klayman et al. 2019)</b>		
<p>RCT; training and support services across systems within 31 state grantees to improve job placement among youth and adults with disabilities. 21,840 adults (21 years or older) and 1,270 (14– 21) youth with disabilities across 179 organizations.</p> <p>Treatment group grantees: n=80 Control group grantees: n=73</p>	<p><b>Exited and employed or enrolled in school in the subsequent calendar quarter (youth):</b> treatment group 60.0%; control group 81.0%; regression adjusted impact estimate -17.6; <math>p = 0.07</math>.</p>	-*
	<p><b>Exited and attained degree or certificate within the following three quarters, among those who were high school dropouts or attending school at the enrollment date (youth):</b> treatment group 59.4%; control group 76.9%; regression adjusted impact estimate -18.9; <math>p = 0.049</math>.</p>	-**
	<p><b>Exited and employed in the subsequent calendar quarter (adults):</b> treatment group 60.1%; control group 60.4%; regression adjusted impact estimate -0.3; <math>p = 0.878</math>.</p>	NS
	<p><b>Exited and employed in the following 3 quarters (adults):</b> treatment group 52.5%; control group 50.6%; regression adjusted impact estimate 1.9; <math>p = 0.445</math>.</p>	NS
	<p><b>Average earnings in the 3 quarters after exit, among those working in all three quarters (adults):</b> treatment group \$2,885; control group \$7,627; regression adjusted impact estimate 49; <math>p = 0.874</math>.</p>	NS
	<p><b>Exited and employed or enrolled in school in the subsequent calendar quarter (youth):</b> treatment group 60.0%; control group 81.0%; regression adjusted impact estimate -17.6; <math>p = 0.07</math>.</p>	-*
<b>JobTIPS (Strickland et al. 2013)</b>		
<p>RCT, ages 16 to 19, had a clinical diagnosis of a pervasive developmental disorder, was characterized by the primary caregiver on the screening form as having an ASD diagnosis with low support needs or Asperger’s Disorder, had regular access to a home computer with an internet connection and could perform basic computer and website navigation functions independently.</p> <p>Treatment group: n=11 Control group: n=11</p>	<p><b>Content score for mock job interview:</b> treatment mean change 0.448, control mean change -0.034, = 17.46, <math>p &lt; 0.000</math>.</p>	+***
	<p><b>Delivery skills score for mock job interview: delivery skills:</b> treatment mean change 0.334, control mean change 0.0252, = 3.93, <math>p = 0.062</math>.</p>	+*
	<p><b>Social Responsiveness Scale for Youth:</b> social awareness treatment rating 67.91, control rating 67.09; social cognition treatment rating 76.18, control rating is 73.18; social communication treatment rating 72.82, control rating 73.82; social motivation treatment rating 74.00, control rating 71.91; autistic mannerism treatment rating 81.18, control rating 79.55; SRS total treatment rating 77.45, control rating 76.64.</p>	NS
<b>Linking Learning to Careers (LLC) (Sevak et al. 2021)</b>		
<p>RCT, ages 14 to 24, all sophomore and junior high school students receiving pre-ETS (and therefore had either an IEP or a 504 plan) or who had an open VR case.</p>	<p><b>Had at least 1 quarter of earnings within 24 months of program enrollment (all):</b> treatment group: 65.6%; control group: 61.0%; <math>p &gt; 0.10</math>.</p>	NS
	<p><b>Had at least 1 quarter of earnings within 24 months of program enrollment (early cohort):</b> treatment group: 65.2%; control group: 70.2%; <math>p &gt; 0.10</math>.</p>	NS



**Appendix C** Experimental study results and ratings

Exhibit C.1 (continued)

Sample description	Employment outcomes	Direction
Treatment group: n=413 Control group: n=390	<b>Had at least 1 quarter of earnings within 24 months of program enrollment (late cohort):</b> treatment group: 66.0%; control group: 54.8%, $p \leq 0.05$ .	+**
<b>Virtual Interview Training for Transition Age Youth (Smith et al. 2021)</b>		
RCT, ages 16 to 26, autistic transition-age youth, at least a 3rd-grade reading level, and willing to be video recorded. Treatment group: n=48 Control group: n=23	<b>Achieved competitive integrated employment at six-month follow-up:</b> treatment group: 25.0%; control group: 0.0%, $=6.9, p < 0.01$ .	+***
	<b>Number of interviews attended by the six-month follow-up:</b> treatment group: 25.0%; control group: 21.7%, $=0.1, p = 0.76$ .	NS
	<b>Achieved any employment type:</b> treatment group: 41.7%; control group: 30.4%, $=0.8, p = 0.18$ .	NS
	<b>Likeliness to be hired (global rating):</b> treatment: pre-test mean 3.1 and post-test mean 3.7; control: pre-test mean 2.9 and post-test mean 2.6; effect size $p = 0.004$ .	+***
	<b>Mock interview total score:</b> treatment: pre-test mean 46.8 and post-test mean 49.6; control: pre-test mean 45.9 and post-test mean 43.6; $p < 0.001$ .	+***
	<b>Job interview self-efficacy:</b> treatment: pre-test mean 47.2 and post-test mean 43.5; control: pre-test mean 45.9 and post-test mean 44.3; $p = 0.358$ .	NS
	<b>Job interview anxiety:</b> treatment: pre-test mean 7.0 and post-test mean 5.7; control: pre-test mean 5.0 and post-test mean 4.4; $p = 0.029$ .	+**
<b>Virtual Reality Job Interview Training (Smith et al. 2014)</b>		
RCT, ages 18–31, an ASD diagnosis with low support needs, actively seeking employment, currently unemployed or underemployed, and required to have a 6th-grade reading level. Treatment group: n=16 Control group: n=10	<b>Overall performance for job interview role-play:</b> Group-by-time interaction = 4.4, $p = 0.046, d = 0.55$ for VR-JIT, $d = 0.05$ for control.	+**
	<b>Job relevant interview content:</b> Group-by-time interaction = 4.0, $p = 0.056, d = 0.42$ for VR-JIT, $d = 0.04$ for control.	+*
	<b>Interviewee performance:</b> Group-by-time interaction = 3.2, $p = 0.086, d = 0.55$ for VR-JIT, $d = 0.06$ for control.	+*
	<b>Job interview self-confidence rating:</b> Group-by-time interaction = 4.0, $p = 0.060, d = 0.96$ for VR-JIT, $d = 0.30$ for control.	+*
<b>Way2Work (Mann et al. 2021)</b>		
RCT, high school juniors and seniors with an IEP or a Section 504 plan who attended school at one of eight Maryland local school systems. Treatment group: n=200 Control group: n=201	<b>Employment outcomes 24 months after enrollment:</b>	
	<b>Worked in paid employment in the past year:</b> treatment group 81.3%; control group 73.6%.	NS
	<b>Enrolled in postsecondary education or working at the time of the interview:</b> treatment group 66.4%; control group 71.9%.	NS
	<b>Worked at any job (paid or unpaid) in the past year:</b> treatment group 81.5%; control group 74.9%.	NS
	<b>Worked at the time of the interview in a paid job:</b> treatment group 43.1%; control group 46.5%.	NS
	<b>Worked at the time of the interview in an unpaid job:</b> treatment group 1.0%; control group 4.0%.	NS
	<b>Number of jobs in the past year:</b> treatment group 1.4; control group 1.2.	NS

Appendix C Experimental study results and ratings

Exhibit C.1 (continued)

Sample description	Employment outcomes	Direction
<b>Moderate evidence rating RCTs</b>		
<b>Virtual Reality Job Interview Training (Smith et al. 2015)</b>		
<p>RCT, ages 18–31, ASD with low support needs, actively seeking employment, currently unemployed or underemployed, and required to have a 6th-grade reading level.</p> <p>Treatment group: n=16 Control group: n=10</p>	<b>Six-month follow-up between-group differences:</b>	
	<b>Weeks looking for a position (job or volunteer):</b> treatment group 13.5; control group 16.3; $\chi^2/T$ -statistic=-0.5; $p > 0.1$ .	NS
	<b>Interviews completed (job or volunteer):</b> treatment group 1.9; control group 2.1; $\chi^2/T$ -statistic=0.2; $p > 0.1$ .	NS
	<b>Completed an interview (job or volunteer):</b> treatment group 80.0%; control group 62.5%; $\chi^2/T$ -statistic=0.8; $p > 0.1$ .	NS
	<b>Received an offer (job or volunteer):</b> treatment group 60.0%; control group 50.0%; $\chi^2/T$ -statistic=0.2; $p > 0.1$ .	NS
	<b>Accepted a position (job or volunteer):</b> treatment group 53.3%; control group 25.0%; $\chi^2/T$ -statistic=1.7 $p < 0.1$ .	+*
	<b>Odds ratio of intervention as a predictor of attaining a competitive position:</b>	
	<b>Post training self-confidence:</b> OR 0.91; $p > 0.1$ .	NS
	<b>Prior paid employment:</b> OR 0.64; $p > 0.1$ .	NS
<b>Attaining competitive employment:</b> OR 7.82, $p < 0.05$ .	+**	
<b>Low evidence rating RCTs</b>		
<b>Assistive Technology (Butterworth et al. 2020)</b>		
<p>RCT; employment consultants who work with individuals with an intellectual or developmental disability; each employment consultant selected one job seeker who recently achieved employment with the employment consultant's primary support. Mean age of the recently hired job seekers was 32 among the treatment group and 29 in the control group.</p> <p>Treatment group: n=107 Control group: n=80</p>	<b>One-year follow-up:</b>	
	<b>Hires:</b> treatment group average change 0.9; control group average change 0.8; $d = 0.01$ ; $p > 0.05$ .	NS
	<b>Hours:</b> treatment group average change 3.5; control group average change -2.4; $d = 0.48$ ; $p < 0.05$ .	+**
	<b>Earnings:</b> treatment group average change \$1.09; control group average change \$0.05; $d = 0.25$ ; $p > 0.05$ .	NS
<b>Months to hire:</b> treatment group average change -2.3; control group average change -0.1; $d = 0.21$ ; $p > 0.05$ .	NS	
<b>Project SEARCH ASD (Wehman et al. 2014a)</b>		
<p>RCT; ages 18 to 21; had an ASD diagnosis and/or educational eligibility of autism; were independent and self-caring (dressing, daily personal hygiene, and eating); capability to provide consent or assent; had continued eligibility for special education services in high school.</p> <p>Treatment group: n=24 Control group: n=20</p>	<b>Acquired employment by June or July after nine-month school year in study:</b> treatment group 87.5%; control group 6.25%; Fisher's exact test, value 23.4222, $df = 1$ , $p = 0.000$ .	+***
	<b>Acquired employment by September or October, one-year after enrollment in the study:</b> treatment group 87.5%; control group 6.25%; Fisher's exact test, value 23.4222, $df = 1$ , $p = 0.000$ .	+***
<b>Project SEARCH ASD (Wehman et al. 2017)</b>		
<p>RCT; ages 18 to 21; youth diagnosed with an autism spectrum disorder or educational eligibility; eligible for supported</p>	<b>Competitive employment at high school graduation:</b> treatment group 74%; control group 6%; $p < 0.001$ .	+***
	<b>Competitive employment three months after the intervention:</b> treatment group 90%; control group 6%; $p < 0.001$ .	+***

Appendix C Experimental study results and ratings

Exhibit C.1 (continued)

Sample description	Employment outcomes	Direction
employment; being a student in the local public school where the research was being conducted; displaying independent self-care; being able to provide consent or assent; having continued eligibility for public school educational services in the coming school year. Treatment group: n=24 Control group: n=20	<b>Competitive employment one-year after the intervention:</b> treatment group 87%; control group 12%; $p < 0.001$ .	+***
	<b>Hours worked weekly at graduation (among employed individuals):</b> treatment group 15.24; control group 1.25; no significance value reported.	NS
	<b>Hours worked weekly three months after the intervention (among employed individuals):</b> treatment group 19.27; control group 1.25; no significance value reported.	NS
	<b>Hours worked weekly one-year after the intervention (among employed individuals):</b> treatment group 19.90; control group 2.5; $p = 0.027$ ; $d = 2.17$ .	+**
<b>Project SEARCH ASD (Wehman et al. 2020)</b>		
RCT; ages 18 to 21; attend local public school where the research was being conducted; have a medical diagnosis of ASD or educational identification of autism; display independent self-care, including using the bathroom, eating, and moving from place to place independently; be eligible for funding through the state VR agency; and have continued eligibility for public school services. Treatment group: n=81 Control group: n=75	<b>Employed in the community without supports at graduation:</b> treatment group 2%; control group 0%; no significance value reported.	NR
	<b>Employed in the community without supports at one-year follow-up:</b> treatment group 4%; control group 1%; no significance value reported.	NR
	<b>Employed in the community with supports at graduation:</b> treatment group 21%; control group 1%; no significance value reported.	NR
	<b>Employed in the community with supports at one-year follow-up:</b> treatment group 49%; control group 3%; no significance value reported.	NR
	<b>Employed in the community with supports 10 hours a week or fewer at graduation:</b> treatment group 2%; control group 1%; no significance value reported.	NR
	<b>Employed in the community with supports 10 hours a week or fewer at one-year follow-up:</b> treatment group 5%; control group 1%; no significance value reported.	NR
<b>Project SEARCH ASD (Schall et al. 2020a)</b>		
RCT; ages 18 to 21; had a medical diagnosis or educational eligibility label of ASD; attended local public school where research was being conducted; displayed independent self-care including using the bathroom, eating, and moving from place to place; were eligible for funding through the state VR office; had continued eligibility for public school services in the coming school year. Treatment group: n=81 Control group: n=75	<b>SIS-A score changes:</b>	
	<b>Home living, from one-year follow-up – baseline:</b> difference between treatment and control -0.55; $p = 0.143$ .	NS
	<b>Community living, from one-year follow-up – baseline:</b> difference between treatment and control 0.27; $p = 0.490$ .	NS
	<b>Lifelong learning, from one-year follow-up – baseline:</b> difference between treatment and control -0.70; $p = 0.057$ .	+*
	<b>Employment, from one-year follow-up – baseline:</b> difference between treatment and control -1.13; $p = 0.018$ .	+**
	<b>Health safety, from one-year follow-up – baseline:</b> difference between treatment and control -0.61; $p = 0.086$ .	+*
	<b>Social, from one-year follow-up – baseline:</b> difference between treatment and control -0.54; $p = 0.134$ .	NS
	<b>Total, from one-year follow-up – baseline:</b> difference between treatment and control -2.91; $p = 0.093$ .	+*
	<b>SNI, from one-year follow-up – baseline:</b> difference between treatment and control -3.21; $p = 0.108$ .	NS
<b>Exceptional behavior, from one-year follow-up – baseline:</b> difference between treatment and control 0.01; $p = 0.983$ .	NS	

Appendix C Experimental study results and ratings

Exhibit C.1 (continued)

Sample description	Employment outcomes	Direction
<b>Low evidence rating QEDs</b>		
<b>Job Coaching Academy (Gilson et al. 2021)</b>		
QED; positions included paraprofessionals, special education teachers, and interveners. Treatment group: n=30 Control group: n=22	<b>Job coaching views (Significance not reported):</b>	
	<b>I have been trained well on how to be a job coach:</b> treatment pre-intervention 42.8%; treatment post-intervention 88.0%; control pre-intervention 45.5%; control post-intervention 65.0%.	NR
	<b>I feel effective in my role as a job coach:</b> treatment pre-intervention 57.2%; treatment post-intervention 100.0%; control pre-intervention 72.7%; control post-intervention 71.4%.	NR
	<b>I feel knowledgeable about the best strategies to use in job coaching:</b> treatment pre-intervention 46.4%; treatment post-intervention 96.0%; control pre-intervention 40.9%; control post-intervention 71.4%.	NR
	<b>I think student/employee independence is an important part of job success:</b> treatment pre-intervention 88.9%; treatment post-intervention 100.00%; control pre-intervention 95.5%; control post-intervention 100.0%.	NR
	<b>I think social integration is an important part of job success:</b> treatment pre-intervention 85.2%; treatment post-intervention 100.0%; control pre-intervention 95.5%; control post-intervention 100.0%.	NR
	<b>Job coaching has a beneficial role in the workplace setting:</b> treatment pre-intervention 100.0%; treatment post-intervention 100.0%; control pre-intervention 95.5%; control post-intervention 100.0%.	NR
	<b>Most of my students are independent in practicing employment skills:</b> treatment pre-intervention 14.3%; treatment post-intervention 48.0%; control pre-intervention 9.1%; control post-intervention 23.8%.	NR
	<b>Most of my students are independent in practicing social skills:</b> treatment pre-intervention 25.0%; treatment post-intervention 56.0%; control pre-intervention 13.6%; control post-intervention 23.8%.	NR
	<b>Coaching proximity faded over time:</b> Wilcoxon signed-rank test result treatment group $W = 1,209.0$ ; $p < 0.001$ ; control group $W = 875.0$ ; $p < 0.001$ .	+***

Note: Asterisks in the direction column indicate the statistical significance: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . Significance testing results are not reported for outcome measures with direction listed as “NR.” High study evidence ratings indicate there is strong evidence that the findings are solely attributable to the intervention examined. Moderate evidence ratings indicate there is some evidence that the findings are attributable, at least in part, to the intervention examined. Other factors not accounted for in the study might also have contributed to the findings. Low evidence ratings indicate there is little evidence that the findings are attributable, in part or as a whole, to the intervention examined. See Appendix Exhibit C.2 for full details on the evidence supporting each assessment rating as defined by the methodology described in Rotz et al. (2020) and “Pathways Clearinghouse Guide for Researchers” (Shiferaw 2022).

ASD = autism spectrum disorder; IEP = individualized education plan; NR = not reported; NS = not significant; OR = odds ratio; QED = quasi-experimental design; RCT = randomized control trial; SIS-A = Supports Intensity Scale® –Adult version; SNI = social needs index; VR = vocational rehabilitation.

**Exhibit C.2. Evidence ratings and reasoning for evidence rating for eligible experimental studies**

Citation	Overall rating	Reason for rating
<b>Randomized control trials</b>		
Butterworth, J., A. Migliore, K. Nye-Lengerman, O. Lyons, A. Gunty, J. Eastman, and P. Foos. "Using Data-Enabled Performance Feedback and Guidance to Assist Employment Consultants in Their Work with Job Seekers: An Experimental Study." <i>Journal of Vocational Rehabilitation</i> , vol. 53, no. 2, 2020, pp. 189–203.	Low	This study reported high sample attrition between random assignment and analysis, so although the study is an RCT, the study design is assessed as a QED. The study did not indicate controlling for any potential differences in the outcome prior to the intervention.
Klayman, D., C. DiBiase, A. Searson, H. Hock, and T. Ketema. "Disability Employment Impact Evaluation: Round 1 Through Round 4 Grantees." U.S. Department of Labor, March 2019. <a href="https://www.dol.gov/sites/dolgov/files/odep/topics/completeddei-1-4report.pdf">https://www.dol.gov/sites/dolgov/files/odep/topics/completeddei-1-4report.pdf</a> .	High	The study does not show evidence of confounding factors, mishandling of missing data, or compromised random assignment. Low study attrition reported between assignment and analysis for adult outcomes.
Mann, D., K. Feeney, T. Honeycutt, and M. Luhr. "Way2Work Maryland Demonstration: Impacts 24 Months After Enrollment." <i>Mathematica</i> , June 30, 2021. <a href="https://www.mathematica.org/publications/way2work-maryland-demonstration-impacts-24-months-after-enrollment">https://www.mathematica.org/publications/way2work-maryland-demonstration-impacts-24-months-after-enrollment</a> .	High	The study does not show evidence of confounding factors, mishandling of missing data, or compromised random assignment. Low study attrition reported between assignment and analysis.
Schall, C., A.P. Sima, L. Avellone, P. Wehman, J. McDonough, and A. Brown. "The Effect of Business Internships Model and Employment on Enhancing the Independence of Young Adults with Significant Impact from Autism." <i>Intellectual and Developmental Disabilities</i> , vol. 58, no. 4, 2020a, pp. 301–313. <a href="https://meridian.allenpress.com/idd/article-abstract/58/4/301/441697">https://meridian.allenpress.com/idd/article-abstract/58/4/301/441697</a> .	Low	This study reported high sample attrition between random assignment and analysis, so although the study is an RCT, the study design is assessed as a QED. The study did not indicate controls for any potential differences in the outcome before the intervention, and the baseline equivalence requirement was not satisfied.
Sevak, P., K. Feeney, T. Honeycutt, and E. Peterson. "Vermont's Linking Learning to Careers Demonstration: Impacts 24 Months After Enrollment." <i>Mathematica</i> , August 2021. <a href="https://www.mathematica.org/publications/linking-learning-to-careers-demonstration-impacts-24-months-after-enrollment">https://www.mathematica.org/publications/linking-learning-to-careers-demonstration-impacts-24-months-after-enrollment</a> .	High	The study does not show evidence of confounding factors, mishandling of missing data, or compromised random assignment. Low study attrition reported between assignment and analysis for service use outcomes and education outcomes.
Smith, M.J., E.J. Ginger, K. Wright, M.A. Wright, J.L. Taylor, L.B. Humm, D.E. Olsen, M.D. Bell, and M.F. Fleming. "Virtual Reality Job Interview Training in Adults with Autism Spectrum Disorder." <i>Journal of Autism and Developmental Disorders</i> , vol. 44, no. 10, 2014, pp. 2450–2463. <a href="https://link.springer.com/article/10.1007/s10803-014-2113-y">https://link.springer.com/article/10.1007/s10803-014-2113-y</a> .	High	The study does not show evidence of confounding factors, mishandling of missing data, or compromised random assignment. Low study attrition reported between assignment and analysis.
Smith, M.J., M.F. Fleming, M.A. Wright, M. Losh, L.B. Humm, D. Olsen, and M.D. Bell. "Brief Report: Vocational Outcomes for Young Adults with Autism Spectrum Disorders at Six Months After Virtual Reality Job Interview Training." <i>Journal of Autism and Developmental Disorders</i> , vol. 10, 2015, pp. 3364–3369. <a href="https://link.springer.com/article/10.1007/s10803-015-2470-1">https://link.springer.com/article/10.1007/s10803-015-2470-1</a> .	Moderate	This study reported high sample attrition between random assignment and analysis, so although the study is an RCT, the study design is assessed as a QED. The study includes post-test self-confidence and prior paid employment as covariates and has satisfied the baseline equivalence rating.



## Appendix C Experimental study results and ratings

Exhibit C.2 (continued)

Citation	Overall rating	Reason for rating
Smith, M.J., K. Sherwood, B. Ross, J.D. Smith, L. DaWalt, L. Bishop, L. Humm, J. Elkins, and C. Steacy. "Virtual Interview Training for Autistic Transition Age Youth: A Randomized Controlled Feasibility and Effectiveness Trial." <i>Autism</i> , vol. 25, no. 6, 2021, pp. 1536–1552. <a href="https://journals.sagepub.com/doi/pdf/10.1177/1362361321989928">https://journals.sagepub.com/doi/pdf/10.1177/1362361321989928</a> .	High	The study does not show evidence of confounding factors, mishandling of missing data, or compromised random assignment. Low study attrition reported between assignment and analysis.
Strickland, D.C., C.D. Coles, and L.B. Southern. "JobTIPS: A Transition to Employment Program for Individuals with Autism Spectrum Disorders." <i>Journal of Autism and Developmental Disorders</i> , vol. 43, no. 10, March 2013, pp. 2472–2483. <a href="https://link.springer.com/article/10.1007/s10803-013-1800-4">https://link.springer.com/article/10.1007/s10803-013-1800-4</a> .	High	The study does not show evidence of confounding factors, mishandling of missing data, or compromised random assignment. Low study attrition reported between assignment and analysis.
Wehman, P.H., C.M. Schall, J. McDonough, J. Kregel, V. Brooke, A. Molinelli, W. Ham, C.W. Graham, J.E. Riehle, H.T. Collins, and W. Thiss. "Competitive Employment for Youth with Autism Spectrum Disorders: Early Results from a Randomized Clinical Trial." <i>Journal of Autism and Developmental Disorders</i> , vol. 44, no. 3, 2014a, pp. 487–500. <a href="https://link.springer.com/article/10.1007/s10803-013-1892-x">https://link.springer.com/article/10.1007/s10803-013-1892-x</a> .	Low	This study reported high sample attrition between random assignment and analysis, so although the study is an RCT, the study design is assessed as a QED. The study did not indicate controlling for any potential differences in the outcome before the intervention.
Wehman, P., C.M. Schall, J. McDonough, C. Graham, V. Brooke, J.E., Riehle, A. Brooke, W. Ham, S. Lau, J. Allen, and L. Avellone. "Effects of an Employer-Based Intervention on Employment Outcomes for Youth with Significant Support Needs Due to Autism." <i>Autism</i> , vol. 21, no. 3, 2017, pp. 276–290. <a href="https://journals.sagepub.com/doi/pdf/10.1177/1362361316635826">https://journals.sagepub.com/doi/pdf/10.1177/1362361316635826</a> .	Low	This study reported high sample attrition between random assignment and analysis, so although the study is an RCT, the study design is assessed as a QED. Age did not have balance across the treatment and control groups.
Wehman, P., C. Schall, J. McDonough, A. Sima, A. Brooke, W. Ham, H. Whittenburg, V. Brooke, L. Avellone, and E. Riehle. "Competitive Employment for Transition-Aged Youth with Significant Impact from Autism: A Multi-site Randomized Clinical Trial." <i>Journal of Autism and Developmental Disorders</i> , vol. 50, no. 6, 2020, pp. 1882–1897. <a href="https://link.springer.com/article/10.1007/s10803-019-03940-2">https://link.springer.com/article/10.1007/s10803-019-03940-2</a> .	Low	This study reported high sample attrition between random assignment and analysis, so although the study is an RCT, the study design is assessed as a QED. The study did not indicate controlling for any potential differences in the outcome before the intervention, and the baseline equivalence requirement was not satisfied.
<b>Low evidence assessment rating QEDs</b>		
Gilson, C.B., and E.W. Carter. "The Job Coaching Academy for Transition Educators: A Preliminary Evaluation." <i>Career Development and Transition for Exceptional Individuals</i> , vol. 44, no.3, 2021, pp.148–160. <a href="https://link.springer.com/article/10.1007/s10803-016-2894-2">https://link.springer.com/article/10.1007/s10803-016-2894-2</a> .	Low	Although this study describes itself as a QED, it randomizes participants into treatment and control groups, so the study was reviewed as an RCT. This study reported high sample attrition between random assignment and analysis, so, ultimately, the study design was assessed as a QED. The study did control for any potential differences in the outcome before the intervention.

Note: The evidence rating assessments are assigned using the methodology described in Rotz et al. (2020) and "Pathways Clearinghouse Guide for Researchers" (Shiferaw 2022).

QED = quasi-experimental design; RCT = randomized control trial.

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