Research Article

Employer Perspectives Toward Hiring and Retaining Individuals with Disabilities: A National Survey of Entry-Level Employers

Journal of Vocational Rehabilitation
2025, Vol. 62(3) 310–324

DOI: 10.1177/10522263251326524
journals.sagepub.com/home/jvr

Kyle Reardon[1], Deanne K Unruh[1] and Dawn A Rowe[2]

Abstract

Background: Finding and maintaining employment is a critical need for individuals with disabilities (IWD) and employers' attitudes toward IWD is a factor in employment rates.

Objective: The study purpose was to better understand perspectives of employers toward hiring and retaining IWD and to compare findings pre- and post-COVID-19 pandemic.

Methods: The researchers developed a survey comprised of questions targeting the hiring practices of employers toward IWD. The survey contained three sections (i.e., demographics, business practices, and skill assessment) and was deployed in two separate waves (i.e., pre-pandemic [survey 1] and post-pandemic [survey 2]).

Results: Employers reported that since the pandemic they have seen an increase in hiring difficulty and while employment of IWD is lower, employers have significantly higher rates of recent hiring and active recruitment of IWD. Mentoring, training, and flexible work schedules were strategies noted by employers as useful in hiring, retaining, and advancing IWD, and employers noted that "basic skills" were generally considered most important. Finally, employers facing labor shortages were more likely to hire or be willing to hire IWD.

Conclusion: Findings indicate that while IWD face multiple employment barriers the post-pandemic labor shortages seem to have created expanded employment opportunities and trends indicate an increased willingness of employers to hire and support IWD in varied settings.

Keywords

developmental disability, employment, career mobility, career choice, workforce

Received: 20 August 2024; accepted: 4 January 2025

Introduction

Meaningful employment is one of the cornerstones of adult life and has been identified as a critical need for individuals with disabilities (IWD; Rogan et al., 2002; Valentini et al., 2019). Not only does a career promote financial independence, but it can also provide an individual with confidence, self-determination, supportive relationships, and engagement within the community (Almalky & Alqahtani, 2022; Di Francesco et al., 2021). Research has pointed to employment contributing to the development of positive and stable identities, improved quality of life, and future career success and potential earnings (Shandra & Hogan, 2008; Wagner et al., 2005). Despite this, research consistently demonstrates that employment rates for IWD fall significantly below those of individuals without disabilities (Kaye, 2010; Lauer & Houtenville, 2017; OECD, 2010; Stapleton & Burkhauser, 2003). Evidence from the Bureau of Labor Statistics (2024) indicates the percentage of persons with disabilities who are employed was only 38.3 percent in November 2023 as compared to 75.3 percent of persons without disabilities. These employment disparities not only affect the economic well-being of

[1]Secondary Special Education & Transition, College of Education, University of Oregon, Eugene, OR, USA
[2]Educational Foundations & Special Education, College of Education, East Tennessee State University, Johnson City, TN, USA

Corresponding Author:
Kyle Reardon, University of Oregon, 901 E. 18th Avenue, Eugene, OR 97401, USA.
Email: kreardon@uoregon.edu

IWD (e.g., low-income levels and high poverty rates), but also their social inclusion (OECD, 2010).

Although much has been accomplished in terms of better understanding the skills needed by IWD to obtain meaningful employment upon transition from high school to adult life, despite continued support from federal legislation and public policy, employment outcomes for IWD continue to underwhelm (Ju et al., 2013). While research has shown that employer perspectives toward hiring IWD is shifting in a positive direction, it remains true that employers with less experience hiring IWD have a higher likelihood of holding misconceptions or bias against particular disabilities and have concerns about higher costs associated with hiring IWD (Baker et al., 2018; Bonaccio et al., 2020; Ju et al., 2013; Kocman et al., 2017). Developmentally, high school can be a pivotal time for students as they are emerging into adulthood and can gain critical skills to prepare them for the workplace. It is important to take employer's perspectives into consideration when preparing students to enter the workforce, to empower students to deal with these biases and misconceptions throughout the process (Rashid et al., 2017).

A considerable body of research has indicated that employment is a critical need for IWD to improve the overall quality of adult life (Rogan et al., 2002). There has been an emphasis in schools, vocational rehabilitation, and other adult agencies on teaching employability skills, or skills, competencies, knowledge, and personal attributes that enable individuals to obtain and maintain employment at all levels (Overtoom, 2000), to IWD during the secondary transition process. Despite this increased emphasis on and awareness of the need to improve employment outcomes, there remains a significant gap between employment rates for IWD and their peers without disabilities (Ju et al., 2014; Lipscomb et al., 2017).

Another influential factor in the increased focus on employability skills instruction is the Workforce Innovation and Opportunity Act (WIOA), a reauthorization of the Workforce Investment Act (WIA) of 1998. WIOA provides funding to state and local workforce initiatives and comprehensive job training services for IWD (Joseph et al., 2017). WIOA requires specific service agencies to provide services to job seekers, helps employers hire employees with requisite skills, and improves overall service delivery for IWD (Joseph et al., 2017). As Ju et al. (2014) indicated, employers play an essential role in improving employment outcomes for IWD.

While preparing individuals for employment has been a dominant theme of secondary education and transition for more than two decades (Wehmeyer & Webb, 2012), there has been less emphasis placed on the willingness of employers to hire IWD. A primary focus of the employment literature to date has been on strategies to improve employment readiness and the identification of factors that influence employment outcomes for students with disabilities. For example, Rabren et al. (2002) identified the predictors of postschool employment for IWD and much of the research has focused on improving employment readiness skills of IWD as opposed to focusing on employers who should be considered an important stakeholder.

There are some studies, however, that examined the attitudes and perspectives of employers and how they influence employment outcomes for IWD. Gilbride et al. (2003) examined the characteristics of employers who are open to hiring and supporting workers with disabilities and found even employers who were willing to hire IWD still had major concerns maintaining explicit and rigorous hiring guidelines and felt IWD who didn't meet these criteria would not be considered for competitive employment positions. In another study on employer perspectives, Houtenville and Kalargyrou (2015) compared hiring practices across industries and found while employers were open to hiring IWD, there remained a concern about outward-facing positions and whether customers were willing to be served by or interact with IWD. Morgan and Alexander (2005), in a comparison study of employers with and without experience hiring IWD, found while most were willing, those with prior experience hiring and working with IWD were more comfortable hiring this demographic.

Because employers are key stakeholders in the job market, their attitudes toward employees have been identified as one of the factors that holds influence over employment rates of IWD (Unger, 2002). Encouragingly, a literature review conducted by Ju et al. (2013) revealed employers are showing increasingly favorable attitudes toward and more willingness to hire IWD and have demonstrated increased awareness of the advantages of doing so. However, a more recent literature review conducted by Lindsay et al. (2023) uncovered a more negative view of experiences of youth with disabilities in the workplace that included pay discrimination, lack of job supports and social inclusion, and job turnover. These experiences may help explain why employment rates for IWD continue to remain low, evidencing a need to better understand how to use employer attitudes and perspectives to influence employability skills training during secondary transition. Better understanding of these perspectives and attitudes may allow transition professionals to align instruction and supports more properly.

While positive employer attitudes may lead to improved employment outcomes for IWD, discrimination or other negative attitudes may lead to employment barriers for this population (Livermore & Goodman, 2009). However, as evidenced from the above literature, while there are some studies that have explored employer perspectives toward hiring IWD, much of the research exists in niche areas and is both incomplete and out-of-date. Thus, a gap has been identified between the preparedness of IWD for competitive integrated employment and the willingness of

employers to hire them. Therefore, it is necessary to better understand the perspectives of employers on IWD in the workforce. Better understanding of this knowledge gap may lead to improved employment outcomes for IWD, and more appropriate job matches, as well as leading to more positive perspectives on hiring IWD on the part of employers.

The purpose of this study was to examine employer perspectives toward hiring and retaining employees with disabilities and to compare findings from before and after the COVID-19 pandemic. Specifically, this study sought to answer the following research questions:

1. What are the perspectives of employers toward, and experiences with, hiring IWD and how do these experiences differ pre- and post-COVID-19 pandemic?
2. What strategies do employers feel would be most effective in hiring, advancing, and retaining IWD?
3. What are the important employability skills as perceived by employers and how do these perspectives differ pre- and post-COVID-19 pandemic?
4. To what extent has the COVID-19 pandemic impacted employer perceptions toward hiring?

Methods

Survey participants were contacted via email in two separate waves (i.e., pre-pandemic [survey 1] and post-pandemic [survey 2]) and asked to respond to an online survey (Appendix A). Informed consent was provided through the first question on the survey instrument, and the study was approved by the institutional review board.

Participants

Participants were 1,616 employers in the United States, with 807 respondents from survey 1 and 809 respondents from survey 2. Twenty-six percent were the owner, president, or vice president of their business; 34% were a general manager or supervisor; 20% were Human Resource (HR) or other hiring personnel; and 20% reported another role in the company related to hiring. Respondents were spread across regions of the U.S. with 19% from the northeast, 22% from the Midwest, 22% from the west, and 37% from the south. Thirty-eight percent of respondents reported working for a large company, while 30% reported working for a midsize company and 26% reported working for a small company. Respondents represented a multitude of industries with education and training (19%) and health care and human services (14%) being the most represented. We conducted chi-square tests of independence to determine if there were significant differences between demographic characteristics of the two survey samples. Results of these tests indicated that there were no significant differences according to geographic region but that there were statistically significant differences according to industry, business size, and role of respondent. See Table 1 for a comprehensive list of participant demographics.

Table 1. Demographic Characteristics From Survey 1 and Survey 2.

	n (%)		
Description	S1	S2	Total
Position in business			
Owner/President/VP	199 (25%)	171 (21%)	416 (26%)
General manager/ supervisor	191 (24%)	217 (27%)	553 (34%)
HR & hiring personnel	154 (19%)	362 (45%)	325 (20%)
Other	263 (33%)	59 (7%)	322 (20%)
Geographic region			
Northeast	168 (21%)	139 (17%)	307 (19%)
Midwest	175 (22%)	179 (22%)	354 (22%)
West	173 (21%)	177 (22%)	350 (22%)
South	283 (35%)	314 (39%)	597 (37%)
Business sector represented			
Agriculture/landscaping/ forestry	8 (1%)	11 (1%)	19 (1%)
Construction & architecture	56 (7%)	68 (8%)	124 (8%)
Education & training	233 (29%)	74 (9%)	307 (19%)
Financial services & banking	62 (8%)	69 (9%)	131 (8%)
Food service	11 (1%)	41 (5%)	52 (3%)
Information technology	64 (8%)	69 (9%)	133 (8%)
Health care & human services	98 (12%)	128 (16%)	220 (14%)
Arts, media, & communication	38 (5%)	17 (2%)	55 (3%)
Sales & marketing	28 (3%)	99 (12%)	127 (8%)
Law, public safety, & corrections	15 (2%)	19 (2%)	34 (2%)
Manufacturing & production	18 (2%)	67 (8%)	85 (5%)
Hospitality, tourism, & entertainment	12 (1%)	20 (2%)	32 (2%)
Other	129 (16%)	127 (16%)	256 (16%)
Size of business			
Large	429 (53%)	286 (35%)	715 (44%)
Midsize	233 (29%)	250 (31%)	483 (30%)
Small	144 (18%)	273 (34%)	417 (26%)

Relative to current practices toward hiring IWD, about half of respondents reported they had difficulty hiring in the past 12 months, and the majority (62%) reported they had unfilled positions in the past 12 months. However, less than half (42%) reported they had had too few applicants in the previous 12-month period. Forty-six percent currently employ IWD, 58% have hired IWD in the previous 12 months, while only 37% actively recruit applicants

Table 2. Current Business Hiring Practices Toward Individuals with Disabilities.

	n (%)		
Description	S1	S2	Total
Difficulty hiring in the last 12 months			
Yes	373 (46%)	438 (54%)	811 (50%)
No	377 (47%)	348 (43%)	725 (45%)
Not sure	55 (7%)	23 (3%)	78 (5%)
Unfilled positions in the last 12 months			
Yes	481 (60%)	525 (65%)	1,006 (62%)
No	290 (36%)	269 (33%)	559 (35%)
Not sure	35 (4%)	15 (2%)	50 (3%)
Few applicants in the last 12 months			
Yes	236 (29%)	439 (54%)	675 (42%)
No	484 (60%)	341 (42%)	825 (51%)
Not sure	87 (11%)	29 (4%)	116 (7%)
Current employees with a disability			
Yes	286 (35%)	456 (56%)	742 (46%)
No	200 (25%)	262 (32%)	462 (29%)
Not sure	319 (35%)	91 (11%)	410 (25%)
Hired IWD in the last 12 months			
Yes	510 (63%)	427 (53%)	937 (58%)
No	178 (22%)	304 (38%)	484 (30%)
Not sure	118 (15%)	78 (10%)	196 (12%)
Actively recruit job applicants who are IWD			
Yes	177 (22%)	420 (52%)	597 (37%)
No	308 (38%)	277 (34%)	585 (36%)
Not sure	322 (40%)	112 (14%)	434 (27%)

who are IWD. See Table 2 for a comprehensive list of current practices toward hiring IWD.

Survey Instrument

The survey was developed by the authors and designed to target the hiring practices and willingness of employers to hire IWD. The survey design was informed by previous employer surveys described in prior studies (e.g., Ju et al., 2014). The survey was designed in three sections: demographics, business practices, and skill assessment. In the demographics section, we sought information about the company size, industry, and geographic region and the position of the individual completing the survey. The business practices section was informed by ODEP (2008) and asked respondents about their current practices relative to hiring IWD and what strategies they believe would help their business to hire, retain, and advance employees with disabilities (see Tables 2 and 3). In these questions we provided a list of strategies (e.g., "developing a targeted recruitment program for individuals with disabilities", "training existing staff", and "employer tax credits and incentives") and asked respondents to select all that apply.

The third section, skill assessment, was a replication from Ju et al. (2014) and asked respondents to rate the importance of a series of skills for entry level employees on a four-point Likert-type scale (i.e., "not at all important", "somewhat important", "very important", and "extremely important"). This section included 40 skills and behaviors that were divided among the five constructs of basic skills (e.g., "ability to read with understanding" and "ability to learn new skills"), higher order thinking skills (e.g., "ability to seek help when needed" and "ability to consider the impact of decisions"), personal management skills (e.g., "ability to follow schedules" and "ability to stay with a task until finished"), interpersonal skills (e.g., "ability to show respect for others" and "ability to advocate for self"), and personal attributes (e.g., "demonstrating personal interest in work" and "demonstrating responsibility in work"). Thirty-six of the items were replicated from Ju et al. (2014) and four items (i.e., "ability to consider the impact of decisions" [basic skills], "ability to employ valid and reasonable research strategies" [basic skills], "ability to attend to personal health and financial well-being" [personal management skills], and "ability to model integrity and ethical leadership [interpersonal skills]) added by the authors. The final section of the survey was only included on survey 2 and asked respondents about the impacts of the COVID-19 pandemic on their hiring practices. The survey took approximately 10 min to complete and was sent in two waves, the first coming in late 2019 prior to the COVID-19 pandemic and the second in 2023 to be able to compare results from pre- and post-pandemic to determine potential changes in or impacts to hiring practices.

Procedures

Survey 1. The procedures for the two survey deployments were slightly different. For survey 1, to obtain feedback from relevant employers responsible for hiring, the researchers purchased an email marketing database of U.S. employers. Potential survey participants were sent a link to the survey via email through the purchased database, though response rate was not able to be calculated, adding a limitation to our study and potential sampling bias. We incentivized potential participants to complete the survey by providing the option to opt into a random drawing for one of 25 gift incentives including Apple Watches, Apple AirPods, and $100 Amazon Gift Cards. The final sample for survey 1 totaled 807 respondents meeting inclusion criteria for whom a completed record of the survey was available. Response data were accessed through the Qualtrics survey platform and were collected in 2019.

Survey 2. For survey 2, participant recruitment, survey distribution, and data collection were completed in about three weeks in 2023 through a purchased service of Qualtrics, a third-party online survey platform and dissemination company. Based on Dillman (2007), we determined that a matching sample size of approximately 800 respondents would be sufficient to analyze between- and within-group differences and provide comparisons with survey 1. Qualtrics screened potential respondents to ensure they met the inclusion criterion of being an individual responsible for hiring decisions at their workplace. Participants provided informed consent prior to beginning the survey; no confidential or identifying information was collected. The final sample for survey 2 totaled 809 respondents meeting inclusion criteria for whom a completed record of the survey was available. Data were accessed through the Qualtrics survey platform.

Data Analysis Plan

The purpose of this study was to understand the perspectives of employers toward hiring IWD and the impact, if any, the COVID-19 pandemic had on these perspectives. Given this research was exploratory, we used descriptive statistics to address each of the research questions. Descriptive statistics, frequency counts, t-tests, and chi-square tests of independence were used in addressing the research questions. All statistical analyses were conducted using R (Version 4.2.1; R Core Team, 2024) and the R packages *broom* (Robinson & Hayes, 2019), *devtools* (Version 2.2.1; Wickham et al., 2019b), *dplyr* (Version 0.8.3; Wickham et al., 2019a), *here* (Version 0.1; Müller, 2017), *janitor* (Version 1.2.0; Firke, 2019), *psych* (Version 1.8.12; Revelle, 2018), *rio* (Version 0.5.16; Chan et al., 2023), and *tidyverse* (Version 1.2.1; Wickham, 2017).

Results

Employer Perspectives on Hiring Individuals with Disabilities

To address research question one we calculated descriptive statistics and frequencies of responses to Q5 ("In the past 12 months, has your workplace had difficulty hiring?"), Q6 ("In the past 12 months, has your workplace had unfilled positions?"), Q7 ("In the past 12 months, have you had openings with few applicants?"), Q8 ("Do any of your company's current employees have a disability?"), Q9 ("In the past 12 months has your company hired any IWD?"), and Q10 ("Does your company actively recruit job applicants who are IWD?") and compared aggregate responses from S1 and S2 using chi-square tests of independence to determine differences from before and after the COVID-19 pandemic. For all tests run, underlying assumptions were met.

The result for Q5 was statistically significant, $\chi^2(2, n = 1{,}616) = 20.82$, $p < .001$, with 54% of S2 respondents reporting having difficulty hiring in the past 12 months, compared with only 46% of S1 respondents. The result for Q6 was statistically significant, $\chi^2(2, n = 1{,}616) = 11.36$, $p = .003$, with 65% of respondents from S2 indicating they had unfilled positions in the last 12 months, compared with 60% of S1 respondents. The result for Q7 was statistically significant, $\chi^2(2, n = 1{,}616) = 114.83$, $p < .001$, with 54% of respondents on S2 indicating they had few applicants in the last 12 months, compared with only 29% of S1 respondents.

The result for Q8 was statistically significant, $\chi^2(2, n = 1{,}616) = 48.82$, $p < .001$, with 53% of S2 respondents indicating their workplace currently employs IWD compared with 63% from S1 which is notably higher. The result for Q9 was statistically significant, $\chi^2(2, n = 1{,}616) = 175.66$, $p < .001$, with 56% of S2 respondents indicating their workplace has hired IWD in the last 12 months, while only 35% of S1 respondents indicated doing so, though of note here is that 35% of S1 respondents were not sure, compared with just 11% from S2. Finally, the result for Q10 was statistically significant, $\chi^2(2, n = 1{,}616) = 202.16$, $p < .001$, with 52% of S2 respondents indicating they actively recruit IWD compared with only 22% of S1 respondents. Of note here as well, however, is that 40% of S1 respondents were not sure compared with only 14% from S2.

Effective Strategies for Hiring, Retaining, and Advancing Individuals with Disabilities

To answer research question two, we examined frequency counts and percentages for each strategy related to hiring, retaining, and advancing IWD in the workplace and compared the results between S1 and S2 to determine whether perspectives changed because of the COVID-19 pandemic. Respondents were presented with a list of potential strategies and asked to select all that apply relative to their potential impact. Two of the items were only shown as strategies for hiring (i.e., "using a recruiting source specializing in placing individuals with disabilities" and "developing a targeted recruitment program for individuals with disabilities") as they did not apply to retaining or advancing employees with disabilities. Table 3 presents the full list of strategies shown to respondents with frequencies displayed as percentages of respondents who indicated the strategy would be helpful for hiring, retaining, and/or advancing IWD.

Respondents indicated the strategies most helpful in hiring IWD were using a recruiting source specializing in placing IWD (46%), mentoring employees with disabilities (36%), offering a flexible work schedule (34%), training existing staff in supporting employees with disabilities (33%), and developing a targeted recruitment program for

Table 3. Strategies for Hiring, Advancing, and Retaining Employees with Disabilities.

	Hiring (%)			Retaining (%)			Advancing (%)		
	S1	S2	Total	S1	S2	Total	S1	S2	Total
Specialized recruiting source	38.91	50.19***	44.55	–	–	–	–	–	–
Targeted recruitment program	24.91	39.68***	32.30	–	–	–	–	–	–
Short-term support w/ job coach	23.71	21.38	20.98	20.32	25.71**	23.02	22.06	26.33***	24.20
Training existing staff	30.11	36.71**	33.42	30.73	40.42***	35.58	29.00	40.79***	34.90
On-site consultation/TA	17.60	14.71	21.10	24.16	24.72	24.44	23.42	25.22	24.32
Mentoring	23.47	38.69**	35.58	37.17	40.54	38.86	36.93	41.29	39.11
Visible management commitment	21.81	19.53	20.67	24.29	21.01	22.65	23.54	24.60	24.07
Centralized accommodations fund	10.66	10.26	10.46	10.90	12.48	11.70	9.67	15.08*	18.56
Disability internship program	17.97	24.35**	21.16	13.75	21.88**	17.82	15.86	23.61***	19.74
Assistive technology	27.76	25.09	26.42	25.40	28.68	27.04	25.53	29.91*	27.72
Flexible work schedule	26.02	42.52***	34.28	23.30	36.46***	29.89	20.20	29.30**	24.75
Employer tax credits and incentives	21.69	19.04	20.36	17.97	17.43	17.70	19.08	19.53	19.31
Reassignment	3.72	4.50	4.08	4.96	7.05**	6.00	3.59	7.29	5.45

Note. *$p < .05$, **$p < .01$, ***$p < .001$ between S1 and S2.

IWD (32%). Regarding retention, respondents felt the most important strategies would be mentoring (39%), training existing staff (36%), and offering a flexible work schedule (30%). Respondents believed mentoring (39%), training existing staff (35%), and utilizing assistive technology (28%) were the strategies most likely to be effective in advancing IWD. The strategies of having a centralized accommodations fund, establishing a disability targeted internship program, taking advantage of tax incentives, and reassigning IWD to other positions were all consistently the least important strategies noted by respondents across all three areas of hiring, retaining, and advancing.

To test differences in the utility of each of these strategies from before and after the onset of the COVID-19 pandemic we conducted chi-square tests of equal frequencies for each strategy across hiring, retaining, and advancing. Results of the significance tests are noted in Table 3 using a series of asterisks to denote whether each strategy had statistically significantly different percentages (i.e., *$p < .05$, **$p < .01$, ***$p < .001$). In most, but not all, instances the percentages for each strategy were higher for S2, but not all were statistically significant.

For hiring strategies, the results for using a recruiting source specializing in placing IWD, $\chi^2(1, n = 1{,}616) = 20.79$, $p < .001$, developing a targeted recruitment program for IWD, $\chi^2(1, n = 1{,}616) = 40.31$, $p < .001$, training existing staff, $\chi^2(1, n = 1{,}616) = 7.91$, $p = .005$, mentoring, $\chi^2(1, n = 1{,}616) = 6.83$, $p = .009$, developing a disability targeted internship program, $\chi^2(1, n = 1{,}616) = 9.87$, $p = .002$, and offering a flexible work schedule $\chi^2(1, n = 1{,}616) = 48.82$, $p < .001$, were statistically significant, with higher percentages coming from S2. For retention strategies, results for short-term on-the-job assistance with an outside job coach, $\chi^2(1, n = 1{,}616) = 8.31$, $p = .004$, training existing staff, $\chi^2(1, n = 1{,}616) = 23.26$, $p < .001$, developing a disability targeted internship program, $\chi^2(1, n = 1{,}616) = 9.55$, $p = .002$, offering a flexible work schedule, $\chi^2(1, n = 1{,}616) = 52.64$, $p < .001$, and reassignment, $\chi^2(1, n = 1{,}616) = 9.56$, $p = .002$, were statistically significant, with higher percentages from S2. For advancement strategies, short-term on the job assistance with an outside job coach, $\chi^2(1, n = 1{,}616) = 11.23$, $p < .001$, training existing staff, $\chi^2(1, n = 1{,}616) = 17.80$, $p < .001$, establishing a centralized accommodations fund, $\chi^2(1, n = 1{,}616) = 6.23$, $p = .01$, developing a disability targeted internship program, $\chi^2(1, n = 1{,}616) = 25.82$, $p < .001$, utilizing assistive technology, $\chi^2(1, n = 1{,}616) = 4.11$, $p = .04$, and offering a flexible work schedule, $\chi^2(1, n = 1{,}616) = 7.50$, $p = .006$, were all statistically significant.

Important Employability Skills for Individuals with Disabilities

To answer research question three, we examined employer mean scores from the 40 skills and behaviors for entry-level employees with disabilities to determine which skills employers believe are the most important. Results are displayed in Table 4 and are organized by S1, S2, and total mean scores across the full sample. Review of the total mean scores reveals that there was only one skill (i.e., "Ability to employ valid and reasonable research strategies" [higher order thinking skills], $M = 2.93$) with a total mean score of less than 3 (i.e., "very important"), indicating that the aggregate sample of employers believe that nearly all the skills across five constructs are very important for entry-level employees with disabilities. We also summarized the five construct mean scores (*italicized* in Table 4) and examination of these scores indicated that basic skills were seen as the most important ($M = 3.39$), followed by interpersonal skills ($M = 3.36$), personal management

Table 4. Importance of Employability Skills in Hiring IWD.

	Item Means		
	S1	S2	Total
*Basic skills****	*3.34*	*3.44*	*3.39*
Ability to read with understanding	3.62	3.65	3.63
Ability to convey ideas in writing	3.11	3.19	3.15
Ability to speak so others can understand*	3.44	3.52	3.48
Ability to listen actively**	3.50	3.59	3.55
Ability to learn new skills***	3.32	3.51	3.42
Ability to apply basic math***	2.83	3.20	3.02
Ability to apply basic technology skills	3.23	3.22	3.22
Ability to follow directions	3.63	3.66	3.65
*Higher order thinking skills****	*3.08*	*3.31*	*3.19*
Ability to solve problems***	3.09	3.29	3.19
Ability to seek help when needed	3.49	3.53	3.51
Ability to use critical thinking***	3.16	3.31	3.23
Ability to use creative thinking***	2.84	3.18	3.01
Ability to consider the impact of decisions***	3.18	3.41	3.29
Ability to employ valid and reasonable research strategies***	2.73	3.14	2.93
*Personal management skills****	*3.18*	*3.45*	*3.32*
Ability to maintain appropriate personal appearance***	3.06	3.43	3.25
Ability to follow schedules***	3.32	3.52	3.42
Ability to be on-time***	3.29	3.57	3.43
Ability to monitor quality of work***	3.25	3.41	3.33
Ability to stay with a task until finished***	3.30	3.51	3.41
Ability to control self and work without direct supervisor***	3.30	3.44	3.37
Ability to accept authority***	3.26	3.52	3.39
Ability to accept criticism***	3.22	3.39	3.31
Ability to show a high regard for safety procedures***	3.24	3.54	3.39
Ability to make plans and work toward goals***	2.98	3.32	3.15
Ability to recognize and correct own mistakes***	3.16	3.43	3.29
Ability to attend to personal health and financial well-being***	2.81	3.30	3.06
*Interpersonal skills****	*3.26*	*3.46*	*3.36*
Ability to use socially acceptable language***	3.34	3.47	3.40
Ability to show respect for others	3.55	3.57	3.56
Ability to work well with individuals from diverse backgrounds**	3.45	3.54	3.49
Ability to cooperate with others and be a good team player**	3.44	3.54	3.49
Ability to model integrity and ethical leadership***	3.19	3.43	3.31
Ability to advocate for self***	2.94	3.32	3.13
Ability to negotiate and resolve conflict***	2.93	3.36	3.15
*Personal attributes****	*3.13*	*3.42*	*3.28*
Demonstrating personal interest in work***	2.96	3.32	3.14
Demonstrating motivation towards work***	3.06	3.38	3.22
Demonstrating personal integrity/honesty in work*	3.47	3.54	3.51
Demonstrating ability to adapt to change***	3.10	3.37	3.23
Demonstrating responsibility in work***	3.35	3.53	3.44
Demonstrating confidence in work***	2.96	3.35	3.15
Demonstrating initiative in work	3.02	3.46	3.24

Note. *$p < .05$, **$p < .01$, ***$p < .001$ between S1 and S2.

skills ($M = 3.32$), personal attributes ($M = 3.28$), and lastly higher order thinking skills ($M = 3.19$).

We also conducted a series of two-tailed independent samples t-tests on the mean scores of each of the 40 skills and behaviors as well as the aggregated mean scores of the five constructs to determine if mean scores from S1 were statistically significantly different from mean scores of S2. Table 4 uses a series of asterisks to denote whether each skill or construct had statistically significantly different mean scores (i.e., *$p < .05$, **$p < .01$, ***$p < .001$), and therefore we will only report here the results of the t-tests on each of the five constructs, all of which were statistically significant (i.e., S2 mean scores were higher than S1 mean scores). For all statistical tests run, assumptions that underlie the test were met.

On basic skills, the aggregated mean score for S2 ($M = 3.44$) was significantly higher than for S1 ($M = 3.34$), $t(1573.8) = -4.32$, $p < .001$. For higher order thinking skills, the aggregated mean score for S2 ($M = 3.31$) was significantly higher than for S1 ($M = 3.08$), $t(1574.1) = -7.42$, $p < .001$. For personal management skills, the aggregated mean score for S2 ($M = 3.45$) was significantly higher than for S1 ($M = 3.18$), $t(1571.3) = -10.98$, $p < .001$. For interpersonal skills, the aggregated mean score for S2 ($M = 3.46$) was significantly higher than for S1 ($M = 3.26$), $t(1598.3) = -7.73$, $p < .001$. And finally, for personal attributes, the aggregated mean score for S2 ($M = 3.42$) was significantly higher than for S1 ($M = 3.13$), $t(1597.7) = -10.89$, $p < .001$. Regarding individual items, there were no statistically significant differences in which mean scores on S1 were higher than mean scores on S2. Additionally, there were only 7 of the 40 skills and behaviors whose mean scores were not statistically significantly different between S1 and S2 (i.e., "Ability to read with understanding" [basic skills], "Ability to convey ideas in writing" [basic skills], "Ability to apply basic technology skills" [basic skills], "Ability to follow directions" [basic skills], "Ability to seek help when needed" [higher order thinking skills], "Ability to show respect for others" [interpersonal skills], and "Demonstrating initiative in work" [personal attributes]), four of which were basic skills.

Impact of COVID-19 Pandemic on Hiring Practices

To answer research question four regarding the labor shortage impact of the COVID-19 pandemic, we analyzed data from four survey questions (i.e., Q17, Q18, Q19, and Q20) that were asked only on S2 ($n = 809$). We conducted chi-square tests of independence between whether an employer has hired IWD in the last 12 months (Q8) or is actively recruiting employees with disabilities (Q10) and Q17 ("What is the level of labor shortage and/or lack of qualified workers to fill needed positions in your company?"), Q18 ("Have you experienced any labor shortage and/or lack of qualified workers to fill needed positions in your company since the start of the COVID-19 pandemic?"), Q19 ("If so, what is the level of the labor shortage/lack of qualified workers experienced by your company since the start of the COVID-19 pandemic?"), and Q20 ("Has this labor shortage changed your practices for hiring individuals with disabilities?") to determine if the COVID-19 pandemic has impacted their recruitment and hiring of IWD.

The result for the relationship between whether an employer has hired IWD in the last 12 months and Q17 was statistically significant, $\chi^2(2, n = 809) = 34.77$, $p < .001$, with 60% of the 522 respondents who indicated they experienced a labor shortage since the onset of the pandemic also indicating they have hired IWD in the past 12 months, compared with 40% for respondents not experiencing a labor shortage. The result for the relationship between hiring IWD in the last 12 months and the level of labor shortage (Q18) was not statistically significant. The result for the relationship between hiring IWD in the last 12 months and Q19 was statistically significant, $\chi^2(2, n = 809) = 96.82$, $p < .001$, with 76% of the 290 respondents who indicated their hiring decisions have been impacted reporting having also hiring IWD in the last 12 months. Finally, the result for the relationship between hiring IWD in the last 12 months and Q20 was statistically significant, $\chi^2(6, n = 809) = 24.78$, $p < .001$, with 60% of respondents who noted a moderate or high increase on their willingness to hire IWD also having hired IWD in the last 12 months.

The result for the relationship between whether an employer actively recruits IWD and Q17 was statistically significant, $\chi^2(2, n = 809) = 29.38$, $p < .001$, with 64% of the 522 respondents who indicated they have experienced a labor shortage since the onset of the COVID-19 pandemic also indicating they actively recruit IWD, compared with 40% for respondents not experiencing a labor shortage. The result for the relationship between actively recruiting IWD and the level of labor shortage (Q18) was not statistically significant. The results for the relationship between actively recruiting IWD and Q19 was statistically significant, $\chi^2(2, n = 809) = 74.24$, $p < .001$, with 71% of the 290 respondents who indicated their hiring decisions have been impacted reporting having also actively recruiting IWD. Finally, the result for the relationship between actively recruiting IWD and Q20 was statistically significant, $\chi^2(6, n = 809) = 28.01$, $p < .001$, with 61% of respondents who noted a moderate or high increase on their willingness to hire IWD also having actively recruiting IWD.

Discussion

The purpose of this study was to better understand the perspectives of employers toward hiring and retaining employees with disabilities and to understand whether and to what degree those perspectives shifted from before and after the COVID-19 pandemic. Our answer to research question 1 is that employers are more likely to report that since the COVID-19 pandemic their workplace has seen an increase in hiring difficulty (i.e., 46% to 54%), an increase in unfilled positions (i.e., 60% to 65%), and fewer applicants for open positions (i.e., 29% to 54%). Additionally, while employers report their actual employment of IWD is lower (i.e., 63% to 53%), they have significantly higher rates of hiring IWD in the last 12 months (i.e., 35% to 56%) and actively recruiting IWD (i.e., 22% to 52%).

Our answer to research question 2 is that using a specialized recruiting source, mentoring employees with disabilities, offering a flexible work schedule, training existing staff, and developing a targeted recruitment program were

the strategies most likely to help in hiring IWD. Mentoring, training, and offering a flexible work schedule were the strategies most likely to help in recruiting IWD; and mentoring, training, and utilizing assistance technology were most likely to help in advancing IWD. Our answer to research question 3 is while all skills were rated as important, basic skills (e.g., "ability to follow directions", "ability to read with understanding", "ability to listen actively", etc.) were considered most important. Also interesting from these findings were that almost all skills were rated higher in importance on S2 than S1, reflecting potential labor market challenges employees faced in the wake of the COVID-19 pandemic.

Survey 2 was conducted in the fall of 2023 when workplace settings were no longer impacted by COVID-19 pandemic health-protective practices but were still impacted by labor market fluctuations (Aughinbaugh & Rothstein, 2022; Ferguson & Lucy, 2023; Kwok, 2021). Research question 4 explored how the labor shortage may impact employer perceptions of hiring IWD, and we found employers experiencing labor shortages were more likely to hire or be willing to hire IWD compared to those employers who were less impacted by the shortage. These results suggest hiring practices may be dictated in part by worker demand, which may be more important to potential employers than job applicant attributes that may be perceived as negative.

Limitations

This study has several important limitations to consider regarding design, analysis, and generalizability. First, we were unable to calculate a response rate for each of the two surveys. While the full sample and each of the two surveys had a relatively large *n* size, the inability to calculate a response rate both leads to sampling bias and precludes the ability to understand how different types of sampling bias may have influence our sample. For example, our sample is likely influenced by nonresponse bias, that is the number of individuals who were given the opportunity to complete the survey but chose not to, but without being able to calculate a response rate we are unable to know to what extent this was a problem. In addition, our study was limited by other types of sampling bias, including self-selection bias. There may be systematic differences between individuals who self-selected into completing the survey than those who didn't, limiting the generalizability of our findings. Our study may have also been impacted by under-coverage bias, that is, some groups (e.g., industry sectors) were inadequately represented in our sample. In addition, employment policies related to IWD vary between states, which also may have impacted our survey responses.

Another limitation in our study relates to the survey design and analysis. While replicated from previous surveys regarding employer perspectives of hiring IWD, the study's utility is limited by the questions included and their relevance to respondents. While the survey included open-ended response options, those opportunities were limited and were not analyzed for the purposes of addressing the research questions. The study was also limited by the lack of crosstab analyses by demographic factors (e.g., company structure, size, location, and industry), and the use of descriptives statistics, t-tests, and chi-squares as opposed to more sophisticated analyses. Finally, the study relied on combining results from two separate surveys with different distribution procedures and statistically significant differences among demographic characteristics, which may impact the generalizability of the findings.

Recommendations for Research

We have several recommendations for future research to continue this line of inquiry. First, regarding the above noted limitation on lack of analysis by company characteristics, future research studies should extend the analyses reported here to compare hiring practices and perceptions across different industries, organizational sizes, and geographic regions. Variations in hiring challenges, strategies, and attitudes towards IWD may exist across sectors, warranting tailored approaches to address specific needs. Future researchers should also conduct a comprehensive study focusing specifically on the importance of employability skills for IWD, exploring factors influencing skill development, perceptions of skill adequacy among employers, and the impact of skill enhancement. This research may be a split-sample factor analysis of the employability skills and behaviors constructs included in the survey. Researchers may also include a differentiation in future studies between skills that employers perceive necessary for all employers as opposed to skills specific to IWD, as this study focused primarily on the latter, and understanding the overlap or differentiation between the two could prove useful to the field.

Next, researchers should consider a qualitative or mixed methods follow-up study to augment quantitative data with qualitative interviews or focus groups to gain a deeper understanding of the reasons behind the observed changes in hiring difficulties, unfilled positions, and strategies for hiring, retaining, and advancing IWD. The qualitative insights may provide context and nuance to the quantitative findings. Future studies should also further investigate the effectiveness of specific hiring strategies, such as using recruiting sources specializing in placing IWD or developing targeted recruitment programs, which could involve experimental or quasi-experimental studies to assess the impact of these strategies on hiring outcomes. This information would be useful for training future rehabilitation counselors in strategies for job seekers. Future research could

also conduct studies to explore strategies for developing employability skills among IWD, particularly focusing on areas identified as important by employers such as basic skills, interpersonal skills, and personal management skills. This could involve intervention studies to test the effectiveness of skill development programs in improving employment outcomes for IWD.

Future research may also consider policy analyses to investigate the impact of existing policies and regulations, as well as potential policy interventions, on the recruitment and retention of IWD. Understanding the interplay between policy frameworks and employer practices can inform targeted policy recommendations to enhance and promote inclusivity in the workforce. Finally, to provide deeper insights into how attitudes and practices evolve over time in response to external factors, future research should include a longitudinal study to track changes in hiring practices, perceptions, and challenges related to IWD over an extended period.

Implications for Practice

The results from the study also have important implications for practice for vocational rehabilitation providers, school personnel, and employers. Specifically for employers, results indicate a significant increase in difficulty in hiring IWD post-COVID-19 compared to pre-pandemic levels, suggesting a need for employers to adapt their hiring practices to address these challenges effectively. VR counselors, special educators, and other job developers need to stay abreast of the changes in hiring practices to ensure their clients and students are trained with these hiring practices and perspectives in mind.

Results also indicate a notable increase in the percentage of employers actively recruiting IWD post-COVID-19, suggesting a positive shift in attitudes towards hiring IWD and highlighting the importance of inclusive recruitment practices. The results also suggest that certain strategies such as using recruiting sources specializing in placing IWD, mentoring programs, offering flexible work schedules, and targeted recruitment programs for IWD are perceived as more effective in hiring, retaining, and advancing IWD. This implies that employers should consider implementing these strategies to enhance their inclusivity efforts. In addition, schools and VR personnel need to capitalize on this shift to ensure their students and clients are workplace ready to be successful on the job. Results also suggest the pandemic has influenced employers' recruitment and hiring practices, particularly in relation to hiring IWD. Employers experiencing labor shortages are more likely to hire and actively recruit IWD, underscoring the need for employers to adapt their practices in response to changing labor market conditions.

Finally, based on the results related to employment skill preferences, special educators and workforce personnel need to ensure students are learning and practicing these skills through work-based learning experiences. If basic skills, interpersonal skills, personal management skills, personal attributes, and higher-order thinking skills are all perceived as important for entry-level employees with disabilities, then workforce personnel and schools should also focus on developing these skills in their students and clients to improve the employability of IWD.

Conclusion

Finding and maintaining meaningful employment is an essential component of community inclusion and for the formation of positive and stable identities for IWD, specifically for youth and young adults who are just emerging into the workforce. Better understanding the perspectives of employers toward hiring IWD can inform training, career readiness skills, and workforce development strategies. Findings indicate that while IWD face multiple barriers toward sustainable employment experiences, the post-pandemic labor shortages seem to have created expanded opportunities for IWD, and trends indicate an increased willingness on the part of employers to hire and support IWD in varied employment settings. A multi-pronged approach targeting preparing IWD for employment and equipping employees with the strategies needed to effectively support them is needed to improve employment outcomes for IWD.

Acknowledgements

The authors have no acknowledgements.

ORCID iD

Kyle Reardon https://orcid.org/0000-0003-1992-9242.

Statements and Declarations

Ethics Statement

This study was approved by the University of Oregon's Institutional Review Board as an exempted study with approval #11132018.104.

Informed Consent

Informed consent was provided by participants on the first page of the online survey. These procedures were approved by the University of Oregon's Institutional Review Board with approval #11132018.104.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of Conflicting Interests

The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: One of the authors of this manuscript, Dawn

A. Rowe, is an editorial board member of the *Journal of Vocational Rehabilitation*.

References

Almalky, H. A., & Alqahtani, S. S. (2022). School and business partnerships to support job training for students with developmental and other disabilities: Employers' perspectives. *Journal of Autism and Developmental Disorders*, *52*(9), 3949–3957. https://doi.org/10.1007/s10803-021-05276-2

Aughinbaugh, A., & Rothstein, D. S. (2022). How did employment change during the COVID-19 pandemic? Evidence from a new BLS survey supplement. *Beyond the Numbers: Employment & Unemployment*, *11*(1), 1–16. https://www.bls.gov/opub/btn/volume-11/how-did-employment-change-during-the-covid-19-pandemic.htm

Baker, P. M., Linden, M. A., LaForce, S. S., Rutledge, J., & Goughnour, K. P. (2018). Barriers to employment participation of individuals with disabilities: Addressing the impact of employer (mis)perception and policy. *American Behavioral Scientist*, *62*(5), 657–675. https://doi.org/10.1177/0002764218768868

Bonaccio, S., Connelly, C. E., Gellatly, I. R., Jetha, A., & Martin Ginis, K. A. (2020). The participation of people with disabilities in the workplace across the employment cycle: Employer concerns and research evidence. *Journal of Business and Psychology*, *35*(2), 135–158. https://doi.org/10.1007/s10869-018-9602-5

Bureau of Labor Statistics. (2024, January 5). *The employment situation – December* 2023 [Press release]. https://www.bls.gov/news.release/empsit.nr0.htm

Chan, C., Leeper, T., Becker, J., & Schoch, D. (2023). Rio: A Swiss-army knife for data file I/O. https://cran.r-project.org/package=rio.

Di Francesco, C., Murahara, F., Martin, V., Flanagan, T., & Nadig, A. (2021). The value of employment support services for adults on the autism spectrum and/or with intellectual disabilities: Employee, employer, and job coach perspectives. *Journal of Vocational Rehabilitation*, *55*(3), 283–296. https://doi.org/10.3233/JVR-211163

Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method*. Wiley.

Ferguson, S., & Lucy, I. (2023, May). *America works data center*. U.S. Chamber of Commerce. https://www.uschamber.com/workforce/america-works-data-center

Firke, S. (2019). Janitor: Simple tools for examining and cleaning dirty data. Retrieved from https://CRAN.R-project.org/package=janitor

Gilbride, D., Stensrud, R., Vandergoot, D., & Golden, K. (2003). Identification of the characteristics of work environments and employers open to hiring and accommodating people with disabilities. *Rehabilitation Counseling Bulletin*, *46*(3), 130–137. https://doi.org/10.1177/00343552030460030101

Houtenville, A., & Kalargyrou, V. (2015). Employers' perspectives about employing people with disabilities: A comparative study across industries. *Cornell Hospitality Quarterly*, *56*(2), 168–179. https://doi.org/10.1177/1938965514551633

Joseph, M. M., Osmanu, K., & Moss, K. (2017). Ethical considerations for working with transition aged youth and students with disabilities given the implications of WIOA. *Journal of Applied Rehabilitation Counseling*, *48*(2), 42–47. https://doi.org/10.1891/0047-2220.48.2.42

Ju, S., Pacha, J., Moore, K., & Zhang, D. (2014). Employability skills for entry-level employees with and without disabilities: A comparison between the perspectives of educators and employers. *Journal of Vocational Rehabilitation*, *40*(3), 203–212. https://doi.org/10.3233/JVR-140685

Ju, S., Roberts, E., & Zhang, D. (2013). Employer attitudes toward workers with disabilities: A review of research in the past decade. *Journal of Vocational Rehabilitation*, *38*(2), 113–123. https://doi.org/10.3233/JVR-130625

Kaye, H. S. (2010). The impact of the 2007-09 recession of workers with disabilities. *Monthly Labor Review*, 19–30. http://www.advancingstates.org/node/52930

Kocman, A., Fischer, L., & Weber, G. (2017). The employers' perspective on barriers and facilitators to employment of people with intellectual disability: A differential mixed-method approach. *Journal of Applied Research in Intellectual Disabilities*, *31*(1), 120–131. https://doi.org/10.1111/jar.12375

Kwok, L. (2021). Labor shortage challenge in post-pandemic: Reasons, possible solutions, and research directions. *Psychology and Behavioral Science International Journal*, *18*(1), 1–13. https://doi.org/10.19080/PBSIJ.2021.18.555976

Lauer, E. A., & Houtenville, A. J. (2017). *Annual disability statistics compendium: 2017*. University of New Hampshire, Institute on Disability. https://eric.ed.gov/?id=ED583160

Lindsay, S., Fuentes, K., Tomas, V., & Hsu, S. (2023). Ableism and workplace discrimination among youth and young adults with disabilities: A systematic review. *Journal of Occupational Rehabilitation*, *33*(1), 20–36. https://doi.org/10.1007/s10926-022-10049-4

Lipscomb, S., Haimson, J., Liu, A. Y., Burghardt, J., Johnson, D. R., & Thurlow, M. L. (2017). *Preparing for life after high school: The characteristics and experiences of youth in special education.* Findings from the National Longitudinal Transition Study 2012. Volume 2: Comparisons across disability groups: Full report (NCEE 2017-4018). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. https://ies.ed.gov/ncee/pubs/20184011/

Livermore, G. A., & Goodman, N. (2009). *A review of recent evaluation efforts associated with programs and policies designed to promote the employment of adults with disabilities*. Rehabilitation Research and Training Center for Employment Policy for Persons with Disabilities, Cornell University. https://hdl.handle.net/1813/90021

Morgan, R. L., & Alexander, M. (2005). The employer's perception: Employment of individuals with developmental disabilities. *Journal of Vocational Rehabilitation*, *23*(1), 39–49. https://doi.org/10.3233/JVR-2005-00295

Müller, K. (2017). Here: A simpler way to find your files. Retrieved from https://CRAN.R-project.org/package=here

OECD. (2010). *OECD Employment outlook 2010: Moving beyond the jobs crisis*. OECD Publishing. https://doi.org/10.1787/empl_outlook-2010-en

Overtoom, C. (2000). *Employability skills: An update*. Center on Education and Training for Employment. ERIC Digest, 220. https://eric.ed.gov/?id=ED445236

Rabren, K., Dunn, C., & Chambers, D. (2002). Predictors of post-high school employment among young adults with disabilities. *Career Development for Exceptional Individuals*, *25*(1), 25–40. https://doi.org/10.1177/088572880202500103

Rashid, M., Hodgetts, S., & Nicholas, D. (2017). Building employer capacity to support meaningful employment for persons with developmental disabilities: A grounded theory study of employment support perspectives. *Journal of Autism and Developmental Disorders*, 47(11), 3510-3519. https://doi.org/10.1007/s10803-017-3267-1

R Core Team. (2024). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/

Revelle, W. (2018). Psych: Procedures for personality and psychological research. (Version 1.8.12). Retrieved from https://CRAN.R-project.org/package=psych

Robinson, D., & Hayes, A. (2019). broom: Convert statistical objects into tidy tibbles. Retrieved from https://broom.tidyverse.org/ and http://github.com/tidymodels/broom

Rogan, P., Grossi, T. A., & Gajewski, R. (2002). Career and vocational assessment. In C. L. Sax, & C. A. Thoma (Eds.), *Transition assessment: Wise practices for quality lives*. Paul Brookes Publishing Co. https://eric.ed.gov/?id=ED462807

Shandra, C. L., & Hogan, D. P. (2008). School-to-work program participation and the post-high school employment of young adults with disabilities. *Journal of Vocational Rehabilitation*, *29*(2), 117–130. https://doi.org/10.3233/JVR-2005-00295

Stapleton, D. C., & Burkhauser, R. V. (2003). *The decline in employment of people with disabilities: A policy puzzle*. Upjohn Institute for Employment Research. https://doi.org/10.17848/9780585473666

Unger, D. K. (2002). Employers' attitudes toward persons with disabilities in the workforce: Myths or realities? *Focus on Autism and Other Developmental Disabilities*, *17*(1), 2–10. https://doi.org/10.1177/108835760201700101

Valentini, B., Carter, E. W., Bumble, J. L., & Hill, E. (2019). Employer views on school-business partnerships involving students with severe disabilities. *Journal of Vocational Rehabilitation*, *50*(3), 365–377. https://doi.org/10.3233/JVR-191019

Wagner, M., Newman, L., Cameto, R., Garza, N., & Levine, P. (2005). *After high school: A first look at the postschool experiences of youth with disabilities.* A report from the National Longitudinal Transition Study-2 (NLTS2). Menlo Park, CA: SRI International. https://eric.ed.gov/?id=ED494935

Wehmeyer, M. L., & Webb, K. W. (2012). *Handbook of adolescent transition education for youth with disabilities*. Routledge. https://eric.ed.gov/?id=ED528526

Wickham, H. Tidyverse: Easily install and load the 'tidyverse'. CRAN. Retrieved from https://CRAN.R-project.org/package=tidyverse2017

Wickham, H., François, R., Henry, L., & Müller, K. (2019a). Dplyr: A grammar of data manipulation. Retrieved from https://CRAN.R-project.org/package=dplyr

Wickham, H., Hester, J., & Chang, W. (2019b). Devtools: Tools to make developing R packages easier. Retrieved from https://CRAN.R-project.org/package=devtools

Appendix A

Employer Survey

Section I. Demographic information.

1. What is your position relative to entry-level employees?
   a. Owner/President/VP
   b. General Manager/Supervisor
   c. HR & Hiring Personnel
   d. Other
2. Geographic Region
   a. Northeast
   b. Midwest
   c. West
   d. South
3. Of what industry is your business a part?
   a. Architecture/Landscaping/Forestry
   b. Construction & Architecture
   c. Education & Training
   d. Financial Services & Banking
   e. Food Service
   f. Information Technology
   g. Health Care & Human Services
   h. Arts, Media, & Communication
   i. Sales & Marketing
   j. Law, Public Safety, & Corrections
   k. Manufacturing & Production
   l. Hospitality, Tourism, & Entertainment
   m. Other
4. What is the size (employee number) of your company?
   a. Large
   b. Midsize
   c. Small

Section II. Business practices.

	Yes	No	Not Sure
a. 5. In past 12 months, has your workplace had difficulty hiring?			
a. 6. In past 12 months, has your workplace had unfilled positions?			
a. 7. In past 12 months, have you had openings with few applicants?			
a. 8. Do any of your company's current employees have a disability?			
a. 9. In the past 12 months has your company hired any IWD?			
a. 10. Does your company actively recruit applicants who are IWD?			

11. Which of the following strategies could be helpful in reducing barriers to **hiring, advancing, and retaining** individuals with disabilities into your company?

	Hiring	Retaining	Advancing
Using a recruiting source specializing in placing IWD		–	–
Developing a targeted recruitment program for IWD		–	–
Short-term on job assistance with an outside job coach			
Training existing staff			
On-site consultation or technical assistance			
Mentoring			
Visible top management commitment			
Centralized accommodations fund			
Disability targeted internship program			
Assistive technology			
Flexible work schedule			
Employer tax credits and incentives			
Reassignment			

Section III. Skill assessment.

Directions: for the questions below, please rate the importance of each skill or attribute for an ENTRY LEVEL job. Check the score that best represents your opinion.

12. Given the ***basic skills*** listed below, please rate the level of importance with regard to ENTRY LEVEL employees.

	Not at all	Somewhat	Very	Extremely
Ability to read with understanding	1	2	3	4
Ability to convey ideas in writing	1	2	3	4
Ability to speak so others can understand	1	2	3	4
Ability to listen actively	1	2	3	4
Ability to learn new skills	1	2	3	4
Ability to apply basic math	1	2	3	4
Ability to apply basic computer/technology skills	1	2	3	4
Ability to follow instructions	1	2	3	4

13. Given the ***higher order thinking skills*** listed below, please rate the level of importance with regard to ENTRY LEVEL employees.

	Not at all	Somewhat	Very	Extremely
Ability to solve problems	1	2	3	4
Ability to seek help when needed	1	2	3	4
Ability to use critical thinking	1	2	3	4
Ability to use creative thinking	1	2	3	4
Ability to consider the impact of decisions	1	2	3	4
Ability to employ valid research strategies	1	2	3	4

14. Given the ***personal management skills*** listed below, please rate the level of importance with regard to ENTRY LEVEL employees.

	Not at all	Somewhat	Very	Extremely
Ability to…maintain personal appearance	1	2	3	4
Ability to follow schedules	1	2	3	4
Ability to be on-time	1	2	3	4
Ability to monitor quality of work	1	2	3	4
Ability to stay with a task until finished	1	2	3	4
Ability to control self and work w/o supervision	1	2	3	4
Ability to accept authority	1	2	3	4
Ability to accept criticism	1	2	3	4
Ability to show high regard for safety procedures	1	2	3	4
Ability to make plans and work toward goals	1	2	3	4
Ability to recognize and correct own mistakes	1	2	3	4
Ability to attend to health & financial well-being	1	2	3	4

15. Given the ***interpersonal skills*** listed below, please rate the level of importance with regard to ENTRY LEVEL employees.

	Not at all	Somewhat	Very	Extremely
Ability to use socially acceptable language	1	2	3	4
Ability to show respect for others	1	2	3	4
Ability to work well with diverse individuals	1	2	3	4
Ability to cooperate with others	1	2	3	4
Ability to model integrity / ethical leadership	1	2	3	4
Ability to advocate for self	1	2	3	4
Ability to negotiate and resolve conflict	1	2	3	4

16. Given the ***personal attributes*** listed below, please rate the level of importance with regard to ENTRY LEVEL employees.

	Not at all	Somewhat	Very	Extremely
Demonstrating personal interest in work	1	2	3	4
Demonstrating motivation towards work	1	2	3	4
Demonstrating personal integrity/honesty	1	2	3	4
Demonstrating ability to adapt to change	1	2	3	4
Demonstrating responsibility in work	1	2	3	4
Demonstrating confidence in work	1	2	3	4
Demonstrating initiative in work	1	2	3	4

Section IV. COVID-19 impact.

17. Have you experienced any labor shortage and/or lack of qualified workers to fill needed positions in your company since the start of the COVID-19 pandemic?

a. Yes
b. No
c. Not sure

18. If so, what is the level of the labor shortage/lack of qualified workers experienced by your company since the start of the COVID-19 pandemic?

(a) Only small impact on our company
(b) Slight impact on our company
(c) Moderate impact on our company
(d) Significant impact on our company

19. Has this labor shortage increased your hiring of individuals with disabilities?

a. Yes
b. No
c. Not sure

20. To what extent has this labor shortage increased the likelihood that you would hire individuals with disabilities?

(a) No impact
(b) Slight increase in willingness to hire
(c) Moderate increase in willingness to hire
(d) High increase in willingness to hire

21. What strategies if your company currently implementing to fill the workforce gap in your company (open-ended)?