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Disability and Rehabilitation

ISSN: 0963-8288 (Print) 1464-5165 (Online) Journal homepage: www.tandfonline.com/journals/idre20

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To cite this article: Laura Mudde, R. Colin Reid & Rachelle Hole (23 Jul 2025): Vocational training for youth with intellectual and developmental disabilities: a program evaluation of the Impact Project, Disability and Rehabilitation, DOI: 10.1080/09638288.2025.2534099

To link to this article: https://doi.org/10.1080/09638288.2025.2534099

Published online: 23 Jul 2025.

DISABILITY AND REHABILITATION
https://doi.org/10.1080/09638288.2025.2534099

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RESEARCH ARTICLE

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Vocational training for youth with intellectual and developmental disabilities: a program evaluation of the Impact Project

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ABSTRACT

Purpose: Previous research in social inclusion investigating low employment rates among individuals with intellectual and developmental disabilities (IDD) points to shortcomings in vocational training for transitioning youth, exiting school environments. This study presents a program evaluation of the Impact Project, a community-based and person-centered vocational training program for youth with IDD, aged 15–19 years, in British Columbia (BC), Canada to assess whether early vocational training improved employment experiences for youth with IDD.

Materials and methods: The study sample included 279 youth with IDD, who were part of summer programs in 2020, 2021, and 2022 at eight established community-based organizations in BC. Employment specialists at these organizations provided vocational activities and training, collecting the youth's employment experiences in pre- and post-program surveys and activity diaries. This evaluation of the Impact Project employed a formative evaluation design to answer whether the youth-centered vocational training improved employment experiences.

Results: Participating in the Impact Project led to an increase in soft skills and unpaid and paid employment experiences for youth with IDD, aged 15–19 years.

Conclusions: Community-based policies could benefit from person-centered approaches when providing employment-related planning for youth with IDD in preparation for transitions from school into employment environments.

➢ IMPLICATIONS FOR REHABILITATION

- Employment is an acknowledged aspect of social inclusion for individuals with intellectual and developmental disabilities.
- Early engagement with youth about to leave school environments should include effective vocational training to promote future social inclusion through employment.
- Youth-centered vocational training in community can improve employment experiences as predictors of future employment outcomes and social inclusion.

ARTICLE HISTORY
Received 10 January 2025
Revised 6 June 2025
Accepted 10 July 2025

KEYWORDS
Community-based research; youth with intellectual and developmental disabilities; employment; person-centered supports; program evaluation

Introduction

The transition of children with disabilities into adulthood is marked by the complexities of bridging child to adult support services [1]. One possible aspect of this complex transition is marked by youth exiting education environments and the potential for exploring employment opportunities [2]. Employment can be a key aspiration for individuals with intellectual and developmental disabilities (IDD) and represents a social inclusion priority [3]. This aspiration requires equal access and opportunity for people with IDD transitioning from education to employment environments. A key predictor for obtaining employment for individuals with IDD is early vocational support, particularly when youth are transitioning out of school environments [3–8].

Specifically, research shows working-age individuals with IDD who were employed upon completion of high school were likely to remain employed and to receive competitive wages [6,8,9]. Research by

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Bowman et al. [5], Mazzotti et al. [7], and Mogensen et al. [3] demonstrates that community connections, early employment, or career and technical education (CTE) lead to better employment outcomes for transition-aged youth after high school. Bowman et al. [5] show that "contextually- or community-based experiences (e.g., structured work experience, work-based learning, linked learning programs, and direct experience strategies) are critical in preparing youth with disabilities for employment" (p. 4160). Moreover, individuals with previous employment or in active employment were likely to remain employed and to receive competitive wages [6–8,10].

To date, research on early vocational training to support youth in obtaining employment has tended to concentrate on youth-specific "job tasks" associated with a particular job (e.g., within retail, stocking shelves or working a cash register), and not necessarily been youth- or person-centered, meaning tailored to the individual's unique strengths and interests. Although a growing number of studies focus on vocational training for effective career planning as an established predictor of employment outcomes (e.g., [7,8,11,12]), the majority of these published materials do not address a Canadian context or the importance of a person-centered approach. A notable exception is a recent study by Bowman et al. [5] in Ontario, Canada. They found that "starting early, taking a person-directed approach to planning," led to improved transitions to employment for youth with disabilities (p. 4158).

Apart from research by Bowman et al. [5], there is a scarcity of research on Canadian community-based vocational training programs focused on youth with IDD transitioning from school to employment environments (see also Khayatzadeh-Mahani et al. [13]). Some available research demonstrates that transition initiatives and planning are "falling short" [8,11,14,15]. In the Canadian province of British Columbia (BC), approximately one in five (21.8%) adults with IDD report having had some form of paid employment [16]. However, employed individuals with IDD tend to receive lower wages (typically minimum wage) and work fewer hours when compared to individuals without IDD [13,15,17–19]. These statistics are striking given the importance of employment as a means of social inclusion [3,17].

Objectives

Given the paucity of research and low employment rates for individuals with IDD in BC, the Impact Project set out to engage youth with IDD, aged 15–19, in the process of transitioning from school to employment. The community-based project focused on vocational training for youth with IDD offering youth-centered employment training specific to the unique needs, strengths, and interests of the participating youth. The project's guiding research question is: Does providing person-centered vocational programming to transitioning youth with intellectual and developmental disabilities improve their employment experiences?

Design

The Impact Project is an ongoing collaborative effort between eight community living organizations, or "project partners," located in British Columbia's Lower Mainland and Southern Vancouver Island regions, and researchers from the University of British Columbia's Canadian Institute for Inclusion and Citizenship (CIIC), referred to as the "research team." Together, the research team and project partners, led by a project manager and consultant, determined the suite of measures to be used. The project partners are not-for-profit organizations that provide a host of services to individuals with IDD and their families. These organizations are members of the BC Employment Network (BCEN), a collective that encourages and supports programming for individuals with IDD to secure and maintain employment. The research team conducted an evaluation of the de-identified results of the project.

The assessment of youth participation in the Impact Project took place in a community-based research context. From the start, the research team, project partners, and project manager and consultant collaborated closely to understand the needs and priorities of the various groups in this project, including community organizations, provincial government, potential employers, and youth participants. To facilitate consistent recording and collection of data, the research team and project consultant co-produced the pre- and post-surveys, various youth-centered vocational training workshops, and activity diaries. In addition, project partner staff and their employment specialists completed mandatory five-day training.

This training included the Supported Employment Application and Foundation Training and Duty to Report training according to provincial guidelines, as well as a Ministry of Child and Family Development workshop and quiz. Specific to the project measures, project partner staff and employment specialists completed training for the proper use of activity diaries, assessment measures, and youth pre- and post-surveys. The project manager and consultant routinely communicated with the project partners to monitor the surveys, vocational training, and the recording of youth activities in the diaries.

At the start of the project, employment specialists completed entrance surveys (T1) with the youth to collect demographic information about the youth and self-identified levels of support need. T1 also established the youth's baseline in their self-defined soft skill levels and unpaid and paid employment experiences. After T1, activity diaries allowed employment specialists to systemically record the type, time, and degree of participation of each youth in vocational training activities. Every contact moment with the youth was recorded for the three-month program. Time spent in any activity or skill training moment was included to report youth engagement and the degree of participation in those vocational activities. At the end of the three-month project, employment specialists completed exit surveys (T2) with the youth to collect self-defined soft skills levels and unpaid and paid employment experiences (Figure 1). After the initial pilot cohort in 2020, the project added follow-up surveys (T3), in which project partners reached out to youth eight months after T2, to collect data about the youth's potential unpaid and paid employment gained since T2. This program evaluation addresses project outcomes with a focus on employment (for more results, see https://inclusionbc.org/empowering-youth-through-the-impact-project-a-journey-of-transformation/).

Project partners provided "vocational training" during the summer school break for transition-aged (15–19 years) youth with IDD. The term "vocational training" refers to individual and group-based activities and training offered both in online and in-person settings. The COVID-19 pandemic resulted in mandated restrictions which meant this study observed the safety of participants, employees, and the community during the summer of 2020 and 2021. This meant some in-person employment discovery and skill building activities, vocational coaching, exploration, and placement were adjusted to online settings. Other activities could be adjusted in terms of the number of people participating in those activities. Generic skill building activities offered to all youth included resume building, navigating employment websites, dressing for employment interviews, and communicating with colleagues and employers. In addition, youth- or person-centered activities included vocational activities specific to the youth's interests. Examples included different employment sectors, such as working with animals, landscaping, working with kids, working in the service industry, or clerical employment. The project partners as community-based agencies are established community connectors for community inclusion and employment training for people with disabilities. At times, this meant employment specialists could rely on established job placements for youth whose interests matched those employment opportunities.

'Youth- or person-centered' activities and engagement referred to the participant-directed intention of the project. Whether online or in-person, employment specialists at the project partner agencies engaged with the youth to establish their interests and potential previous experiences with employment. This youth-centered engagement included the tailoring of potential unpaid and paid employment opportunities in the community to individual youth's interests. Specifically, such youth-centered vocational training refers to individualized and developmentally appropriate training and activities to equip youth with

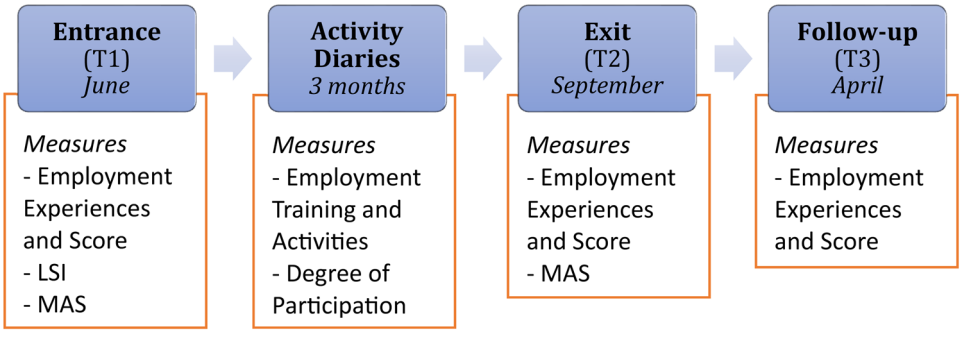

Figure 1. Data collection schedule.

the skills and experiences they require for their chosen field of employment. Employment specialists would use one-on-one activities to learn what is of interest to the youth and connect to community employers for on-the-job training, job placements with or without a job coach, or volunteering. These youth-centered interventions focus both on hard and soft skills (e.g., job-specific or technical skills as well as teamwork or punctuality) and could include transportation training. Such a youth-centered approach considered the variability in youths' exposure and knowledge about employment. When circumstances warranted it, employment specialists used processes of trial and error to explore the youth's interests.

The specific age-range of participants meant youth were exposed to potential employment pathways for the building of confidence and "soft skills." Soft skills referred to personal and interpersonal skills that help youth succeed in the workplace, including skills in teamwork, communication, and time management. Such exposure was given preference over trying to find permanent and full-time employment, especially considering that the majority of these youth returned to school after their summer project concluded. In part, youth were exposed to these "soft skills" through mock interviews, employment workshops, and teambuilding activities.

The term "employment experiences" refers to unpaid and paid employment with the intention of developing and building the skills needed to obtain and retain paid employment in the future. The Impact Project and this program evaluation refer to "employment experiences" to be inclusive where the "experiences" describe both gaining employment and the associated hard and "soft skills" that support youth in preparation of future employment and leaving school environments. Unpaid employment experiences refer to employment contracts in various industries where employers did not offer payment for the youth their services and on-the-job training.

Materials and methods

This program evaluation used a concurrent mixed methods formative evaluation design [20]. The mixed-methods and community-based research design combined qualitative methods with quantitative surveys to provide a comprehensive program evaluation. Project partners provided their preferred evaluation measures to inform the project's surveys and part of this community-based research design involved the inclusion of iterative feedback. Exploratory evaluation measures did not reflect previously validated measures, but were co-produced with project partners, making evaluation findings actionable and relevant for community stakeholders, provincial government, and participants [21].

The current evaluation engaged with quantitative results from the Impact Project, collected during the summers of 2020, 2021, and 2022. These findings were based on the results of the first three years of the six-year project (2020–2025). Qualitative findings for the summers of 2020, 2021, and 2022 are presented elsewhere. Ethics approval (H19-04002) for the Impact Project was obtained through the UBC Okanagan Behavioral Research Ethics Board. Signed consent was obtained for all participants, either directly from the youth or from their parent(s)/caregiver(s).

Procedures

Youth were recruited through the project partners' school districts. Information flyers were distributed to parents/caregivers of eligible youth through the various inclusive education departments. The flyers invited the parents/caregivers and their youth to an information session held by project partners. School referral and recruitment into the summer program did not differ depending on the youth's return to school, as none of the youth were aging out of potential participation. Youth participation did not differ depending on their return to school and was not statistically significant looking at results in youth their degree of participation, gained employment experiences, or other measures when controlling for age. Interested youth were invited to participate in their respective community-based program over the summer. The project partners ran the project's vocational training activities from the start of summer in June until the end of summer in September.

To be eligible for inclusion in the program, youth were required to meet the following criteria: aged 15–19 years at entry into the program; previously diagnosed with IDD; and no previous participation in

the program. Eligible youth who declined to participate in the program or who were waitlisted for future participation in the project due to the capacity limit of project partners were invited to be part of a "comparison group" as required by the Ministry and funding of the project.

This comparison group serves as a reference, or contextual group, and provides a benchmark for understanding the potential change in youth experiences and skills in the participating group. Youth in the comparison group were selected based on the same inclusion criteria as the participant group. The participant and comparison groups were similar in terms of age, gender, and previous employment experiences. In the context of community-based research, a traditional control group was not appropriate, and the project's comparison group did not reflect a rigorous control group typical of clinical studies that are conducted in a controlled environment. Youth in the comparison group did not receive any vocational training, but did complete the pre- and post-project surveys (T1, T2, and T3). The comparison group allowed us to make tentative comparisons with the employment experiences of the participant group.

Data collection was conducted in collaboration with the researchers at the University of British Columbia's Canadian Institute for Inclusion and Citizenship (CIIC). Employment specialists completed entrance surveys (T1) around the end of May or beginning of June, exit surveys (T2) around September, and follow-up surveys (T3) about eight months after T2 with participant and comparison group youth. These specialists kept track of the youth involvement in vocational training activities, recording each youth's degree of participation in their activity diary to measure how involved the youth were during the summer programming. Youth in both groups received $25 gift cards at each of T1, T2, and T3.

Measures

Employment data analyzed in this study refers to the dependent variable of employment experiences, which serves as the primary outcome of interest in this study. The dependent variable is operationalized through measuring unpaid and paid employment at T1, T2, and T3, expressed as employment scores to provide a basis for understanding the impact of the independent variables. Independent variable measures include the Level of Support Inventory (LSI), the Meticulon Assessment Survey (MAS), and the degree of participation in vocational training. The LSI was designed to measure the self-identified level of support needed in seven areas for each youth. The MAS addressed soft skills in nine domains, where the youth self-rated their capacity in these soft-skill domains along a Likert-scale as predictors of employability. The degree of participation in vocational training was measured as the youth's actual presence and participation in vocational training activities. All data collected by trained employment specialists at the eight community-based organizations, linked to the BC Employment Network (BCEN), were de-identified and processed for reporting results of the program to funding partners by the research team. Consistency and quality of data collection were managed by the project consultant employed by the BCEN and the CIIC research team.

Employment experiences

Project partner employment specialists reported on participant and comparison group employment experiences based on previous (T1) and attained employment (T2 and T3), to evaluate changes in employment experiences. Employment experiences included the recorded descriptive paid and unpaid employment. Employment experiences were expressed as ordinal employment scores to assess change over time.

First, the employment score as based on the youth's employment experiences at T1 is an ordinal variable with scores ranging from 0 to 3; "0-No Previous Unpaid or Paid Experience," "1-Only Previous Unpaid Experience," "2-Only Previous Paid Experience," and "3-Both Previous Unpaid and Paid Experience." The rationale behind scoring unpaid, paid, or both types of employment in this manner was derived from CLBC [16] referenced in the introduction and realities of employment among youth with IDD aged 15–19. The different scores assigned to unpaid (1) and paid (2) employment experiences were based on evidence that unpaid employment experiences among youth with IDD are easier to obtain than paid employment for competitive wages [16]. The program evaluation of employment experiences defines those in the

context of community settings, where the realities of learning and gaining experiences for youth with disabilities between 16 and 19 years of age include both unpaid and paid jobs. Unpaid employment involves the learning of valuable "soft skills" and employment-specific skills that research shows (e.g., [5,7,18,22]) benefits ultimate paid employment experiences. In turn, the highest score for both unpaid and paid (3) employment was based on the notion that exposure to both unpaid and paid employment environments reflected more knowledge about employment in different environments for this demographic.

Employment scores measured at the ordinal level did not reflect a score based on equidistant or equal intervals, but did reflect a meaningful rank order of youths' employment experiences gained during the project. That is, although differences between ranks were not uniform, they did provide insights into the relative standing of youth employment experiences.

However, it is not uncommon for researchers to use ordinal variables in statistical techniques that assume interval level measures. In this study, employment scores rely on an underlying continuous variable that measures the potential increase in the level of employment experiences [23]. Therefore, employment scores were interpreted in terms of ranking, where a higher score reflected a higher level/variety of employment experiences. The employment score at T1 for each youth in the participant and comparison groups represented a score before exposure to vocational training or a score that reflected employment experiences at that point in time. A higher score at T1 indicated a higher level/variety of paid and unpaid employment. For the participant group, this was the score before youth-centered vocational training offered through the community-based project partners.

Second, to address employment experiences at T2, the employment score at T2 was based on the employment score at T1 and any gained employment reported at T2. The employment score at T2 was an ordinal variable with a minimum score of 0 and a maximum score of 6. For example, if a youth with previous paid employment at T1—reflecting an employment score of 2—gained unpaid employment experience during the summer as reported at T2, this would lead to an employment score of 3 at T2. Overall, a higher score indicates a higher level/variety of paid and unpaid employment experiences at T2.

Similarly, employment scores at T3, eight months after T2, added reported employment experiences since T2 (for those youth that completed T3; $n = 207$). The employment score at T3 was tabulated as an ordinal variable with a minimum score of 0 and a maximum score of 9 for those youth who reported their unpaid and paid employment at T1 and potential gained paid and unpaid employment at T2 and T3. A higher score indicated an overall higher level/variety of unpaid and paid employment experiences at T3. The range in the potential gain in employment score was 0 to 6 for all youth. These employment scores (ES) and employment experiences (EE) can be expressed as:

Employment score ES at T1 (*EE* at *T1* = *ES* at *T1*) for $n = 279$
Employment score ES at T2 (*ES* at *T1* + *EE* at *T2*) for $n = 279$
Employment score ES at T3 (*ES* at *T2* + *EE* at *T3*) for $n = 207$[1]

Level of Support Inventory (LSI)

The Level of Support Inventory (LSI) from the Arc's Self-Determination Scale [24] measured the youth's self-assessed level of support needs in seven key areas of support and independence. The full 72-item Arc's Self-Determination Scale was developed based on a comprehensive evaluation of more than 400 adults with IDD in the U.S. [24]. The LSI is used in the full Arc's Self-Determination Scale as a subscale and strengths-based approach that measures "level of disability." Youth were asked to answer the question "How much support do you need with …?" in the areas of self-care, learning, mobility, self-direction, receptive and expressive language, capacity for independent living, and economic self-sufficiency. The answer options were "1-None," "2-A Little," or "3-A Lot" of support needed. The LSI is an additive score, with scores constrained to values between seven and 21; the higher the score, the greater the overall self-assessed need for support. The LSI was completed by youth in participant and comparison groups.

Meticulon Assessment Survey (MAS)

The MAS was adopted from the Meticulon Assessment Service bundle developed by Meticulon Consulting [25] to assess multiple "soft skills" as predictors for obtaining and retaining employment. The Impact

Project adopted the MAS as an exploratory measure for youth to rate their soft skill levels, and this program evaluation looked at results in nine of the MAS soft skill domains: Time expectations (3 items); Organizational skills (4); Authority interactions (3); Teamwork (4); Perseverance (3); Responsibility (3); Motivation level (3); Mindfulness (3); and Self-awareness (3). Responses were rated on a 5-point Likert-scale: "1-Strongly Disagree," "2-Disagree," "3-Neither Agree nor Disagree," "4-Agree," to "5-Strongly Agree." Each of the domains was treated individually pertaining to that specific soft skill and youth completed the survey at T1 and T2 to allow for the accounting of observed changes in employment experiences over time. Scores within each domain were added and divided by the number of items in that domain. Each domain therefore has a score between 1 and 5, regardless of number of items comprising it. A higher score indicates a more favorable assessment of each domain or soft skill. The MAS was completed by both participant and comparison groups.

Degree of participation

Employment specialists used activity diaries to record youth activities and assessed the degree of participation in the youth-centered vocational activities in four domains: skill building; employment discovery activities; employment coaching; and employment training. Employment specialists recorded each youth's degree of participation in their activity diary to record how involved the youth was during activities. The degree of participation was scored as: "0% participation—scored 0"; "1–25% participation—(1)"; "26–50% participation—(2)"; "51–75% participation—(3)"; and "76–100% participation—(4)." It is important to note that only youth in the comparison group scored 0 as their degree of participation. All youth in the participant group scored between 1 and 4 (i.e., >0).

Data analysis

Data were analyzed using SPSS data analysis software (IBM SPSS Statistics Data Editor 27). Descriptive results are included in Table 1 for the demographic characteristics of the participant and comparison groups. Descriptive results for youths' employment experiences in the participant and comparison groups at T1, T2, and T3 are expressed as employment scores (ES) in Table 2 and analyzed by comparing employment scores for each of the three relevant data collection points (T1, T2, and T3) to assess change over time at (ES T3-T1), (ES T2-T1), and (ES T3-T2). For the MAS, paired samples *t*-tests were used to assess change over time in the mean scores measured at T1 and T2 for each of the nine MAS soft-skill domains (Table 3). Change over time in these mean scores for participant and comparison groups were compared for the purpose of understanding the potential change in youth experiences and skills in the participant group. Pearson bivariate correlation analyses were used to estimate the associations between; (a) the degree of participation and the youth's self-determined 7-item LSI; (b) the degree of participation and change in MAS domain scores at T2; and (c) the degree of participation and employment score changes at (ES T3-T1), (ES T2-T1), and (ES T3-T2).

Results

Vocational activities and training took place with 252 participants with a mean age of 17.1 years ($SD = 1.2$ years). The participant group was recorded as 73.2% male, 17 years of age on average, and 96 participants (38.4%) had completed Grade 12. Descriptive statistics (Table 1) for the participant and comparison groups were similar on all variables.

Level of Support Inventory (LSI)

For 244 participants,[2] the mean score on the LSI was 1.87 ($SD = 0.37$). Mean scores for each of the seven areas of assistance ranged from a low of 1.38 for self-care to a high of 2.22 for each of two items: learning and economic self-sufficiency. By comparison, for the 27 youth in the comparison group, the mean score on the LSI was 1.74 ($SD = 0.37$). Mean scores for each of the seven areas of assistance ranged from a low of 1.22 for self-care to a high of 2.30 for learning. Results of an independent samples t-test of the difference in mean scores on the LSI between the participant group ($N = 244$; $\bar{X} = 1.87$;

Table 1. Descriptive statistics: participant and comparison groups.

	Participant group			Comparison group		
Age at T1 (years)	*N**	Mean**	*SD****	*N*	Mean	*SD*
	252	17.1	1.2	27	16.5	1.0
		%			%	
15	28	11.1		4	14.8	
16	49	19.4		10	37.0	
17	81	32.1		9	33.3	
18	65	25.8		3	11.1	
19	29	11.5		1	3.7	
Gender identification	*N*	%		*N*	%	
	250[a]	100		27	100	
Male	183	73.2		19	70.4	
Female	65	26.0		8	29.6	
Non-binary	2	.8		–	–	
Missing	2					
Education level at T1 (Grade)	*N*	%		*N*	%	
	250[b]	100		25[c]	100	
Grade 8	1	.4		–	–	
Grade 9	5	2.0		1	4.0	
Grade 10	48	19.2		5	20.0	
Grade 11	72	28.8		13	52.0	
Grade 12	96	38.4		5	20.0	
Post grade 12[d]	28	11.2		1	4.0	
Missing	2			2		
Employment experience at T1	*N*	%		*N*	%	
	252	100		27	100	
None	49	19.4		4	14.8	
Unpaid only	117	46.4		12	44.4	
Paid only	15	6.0		4	14.8	
Both paid and unpaid	71	28.2		7	25.9	

*N refers to the number of participants.
**Mean refers to the arithmetic average of a variable.
***SD refers to standard deviation.
[a]2 missing.
[b]2 missing.
[c]2 missing.
[d]Refers to Grade 13 and education completed after Grade 12.

$SD = 0.37$) and the comparison group ($N = 27$; $\bar{X} = 1.74$; $SD = 0.37$) did not indicate a statistically significant difference.

Employment experiences

At T1, 37 (14.8%) participants had previous paid and unpaid experience (score of 3), 86 (34.1%) previous paid employment experience (score of 2), 188 (74.6%) had previous unpaid employment experience (score of 1), and 49 (19.4%) had neither unpaid nor paid employment before participation in the project (score of 0). Youth in the comparison group reported similar previous employment experiences. At T2, employment specialists reported that from the participant group, 75 youth (29.8%) gained unpaid employment. Sixty-four youth (25.4%) gained paid employment and 50 youth (19.8%) gained both paid and unpaid employment. This means that 75% of the youth in the participant group gained some form of employment against 25% who did not. In the comparison group, 19 youth (70.4%) gained no employment against 29.6% who did gain employment over the same period between T1 and T2 without receiving vocational training offered by the project partners. Employment experiences varied in terms of the average hours worked depending on the youth their capacity and the employment industry. Over 60% of employment experiences took place in retail and hospitality, and paid employment most often meant minimum wage.

Two hundred and seven youth reported their employment experiences 8 months after the project (T3). Employment specialists reported that from the participant group, 50 youth (26.6%) gained paid and unpaid employment after T2. In the comparison group, two youth (10.6%) gained unpaid and paid employment during the period between T2 and T3.

Employment scores for the purpose of program evaluation reflected overall employment experiences. To gauge change over time and controlling for previous employment experiences at T1 for participant and comparison groups, Table 2 reflects employment score changes over time as; (a) T3-T1 for $n = 207$

Table 2. Employment scores (ES) for T3-T1, T2-T1, and T3-T2 ($n = 207$).

ES T3-T1		*N*	%
Comparison group	0	14	73.7
	1	2	10.5
	3	2	10.5
	4	1	5.3
	Total	19[a]	100.0
Participant group	0	29	15.4
	1	49	26.1
	2	47	25.0
	3	45	23.9
	4	14	7.4
	5	4	2.1
	Total	188[b]	100.0
ES T3-T2		*N*	%
Comparison group	0	17	89.5
	1	1	5.3
	2	1	5.3
	Total	19[a]	100.0
Participant group	0	138	73.4
	1	32	17.0
	2	15	8.0
	3	3	1.6
	Total	188[b]	100.0
ES T2-T1		*N*	%
Comparison group	0	15	78.9
	1	1	5.3
	2	1	5.3
	3	2	10.5
	Total	19[a]	100.0
Participant group	0	39	20.7
	1	56	29.8
	2	52	27.7
	3	41	21.8
	Total	188[b]	100.0

[a]8 missing.
[b]64 missing.

Table 3. Paired samples *t*-test MAS mean scores T1 and T2.

Domain	Mean T1	Mean T2	Difference T2-T1
Participant group			
Time expectations	3.87	4.01	0.14**
Organization	3.92	4.03	0.11*
Authority	3.86	4.07	0.21***
Teamwork	3.92	4.10	0.18***
Perseverance	3.69	3.83	0.14***
Responsibility	3.85	3.96	0.11*
Motivation level	4.15	4.11	−0.04
Mindfulness	4.33	4.42	0.09*
Self-awareness	3.78	3.93	0.15***
Comparison group			
Time expectations	3.84	3.81	−0.03
Organization	3.92	3.76	−0.16
Authority	3.89	3.74	−0.15
Teamwork	4.07	3.80	−0.27
Perseverance	3.95	3.64	−0.31
Responsibility	4.00	3.89	−0.11
Motivation level	4.19	4.06	−0.13
Mindfulness	4.31	4.07	−0.24
Self-awareness	3.85	3.68	−0.17

*$p \leq 0.05$, **$p \leq 0.01$, ***$p \leq 0.001$.

(employment score at T3 minus employment score at T1); (b) T2-T1 for $n = 207$ (ES at T2 minus ES at T1); and (c) T3-T2 for $n = 207$ (ES at T3 minus ES at T2). These scores reflected gained employment experiences over 11 months (time between T1 and T3), 3 months (time between T1 and T2), and 8 months (time between T2 and T3).

For T3-T1, 159 youth in the participant group (84%) gained at least unpaid employment. In the comparison group, 5 youth (26%) gained at least unpaid employment over the same period. For T2-T1, 149 youth in the participant group (79%) gained at least unpaid employment, with 41 youth (22%) gaining

both unpaid and paid employment, and 52 (28%) gaining only paid employment. In the comparison group, 1 youth (5%) gained unpaid employment, 1 (5%) unpaid employment, and 2 youth (11%) gained both unpaid and paid employment (without vocational training). For T3-T2, 50 youth in the participant group (27%) gained at least unpaid employment after the conclusion of their participation in youth-centered vocational training. Among the comparison group, two youth (11%) gained additional employment.

MAS

The MAS was completed by participant and comparison groups during T1 and T2 to assess self-rated level of soft skills, and to estimate change in skill level over time (T2-T1). Table 3 shows mean scores for each of the nine MAS domains at T1 and T2 for both groups, and the results of the paired samples t-tests. Statistically significant increases were observed for eight of the nine MAS domains for the participant group, while no significant changes were found for any of the domains among youth in the comparison group (small comparison sample size noted). To summarize, participating youth exposed to person-centered vocational training exhibited overall improvement but comparison group youth did not.

Degree of participation

Of the total sample, 182 youth (65.2%) were very involved in the project's vocational training and activities. Of the youth in the participant group, 8 (2.9%) were not very involved, 19 (6.8%) moderately active, and 43 youth (15.4%) were active. The twenty-seven youth in the comparison group reflect 9.7% of the total sample at 0% participation in vocational training.

Correlations

A bivariate correlation between the degree of participation in youth-centered vocational training and the LSI showed a statistically significant relation. The degree of youth participation was positively correlated with the 7-item LSI ($r = 0.148$; $p \leq 0.05$),[3] that is, the greater the level of support needed, the greater the participation.

A bivariate correlation between the degree of participant involvement in vocational training and the MAS difference in mean scores of five domains showed a statistically significant relationship between those variables. The degree of participation in vocational training and domains of mindfulness ($r = 0.121$; $p \leq 0.05$),[4] and self-awareness ($r = 0.126$; $p \leq 0.05$)[5] showed a positive relationship. The degree of participation in vocational training was positively correlated to the domains of authority ($r = 0.154$; $p \leq 0.01$),[6] teamwork ($r = 0.207$; $p \leq 0.01$),[7] and perseverance ($r = 0.162$; $p \leq 0.01$).[8]

A bivariate correlation between the degree of participation in vocational training and employment scores measured for (a) T3-T1; (b) T2-T1; and (c) T3-T2 for 207 youth in the participant and comparison groups all showed a statistically significant positive relationship. Employment score differences measured between T3 and T1 showed a positive relationship with the degree of participation ($p \leq 0.001$). Employment score differences measured between T2 and T1 showed a positive relationship with the degree of participation ($p \leq 0.001$).

For the 188 youth in the participant group who completed all surveys (T1, T2, and T3), previous unpaid and paid employment experiences expressed as an employment score at T1 were positively correlated to the employment experiences expressed as employment scores at T2 ($r = 0.751$; $p \leq 0.001$) and T3 ($r = 0.735$; $p \leq 0.001$).

However, no statistically significant correlation was found between the employment score difference between T3 and T2 and the employment score difference between T2 and T1. This indicated that previous employment experiences were in a relationship with gaining additional employment experiences, but that employment experiences gained over the eight months after their participation in the project were not statistically significantly connected to the employment experiences gained in the three months during the project. Nevertheless, employment score differences measured between T3 and T2 showed a positive relationship with the degree of participation during the project ($p \leq 0.05$).

Discussion

The research question central to evaluating the community-based Impact Project was whether vocational training, using a youth-centered approach will improve employment experiences for youth with IDD between 15 and 19 years of age. Study participants included 279 youth with IDD, who participated in summer programs in 2020, 2021, and 2022 at eight community-based organizations in BC. The research team evaluated the project using a concurrent mixed-methods and formative evaluation design to address whether youth-centered vocational training improved employment experiences for youth with IDD.

The success of the project in increasing youth's employment experiences through a youth-centered and community-based approach detailed in the results above is commensurate with existing research (e.g., [5,7,18,22]). The bivariate correlation between employment experiences measured at T1, T2, and T3 confirmed that previous unpaid and paid employment is more likely to result in gaining additional employment experiences. Employment scores measured at T1, T2, and T3 demonstrated a positive change (e.g., an increase in paid and unpaid employment) because of the youths' involvement with vocational activities and training offered through the project partners. Participant surveys at T1, T2, and T3 in combination with the youths' degree of participation recorded in activity diaries reflected a positive relation. The project provided a youth-centered conduit to explore different kinds of employment through vocational training (e.g., skill building, job exploration), that in turn positively improved self-rated soft skills.

In context, in a statewide survey of 596 high school teachers in the U.S., Carter et al. [18] found that the most prominent barriers to youth with IDD getting a job were social skills, employment skills, and motivation. In the context of this program evaluation, results confirm the validity of both unpaid and paid employment experiences for the development of the youth their "soft skills." While unpaid employment can be a different employment experience, it can prove a valuable factor for reducing barriers to paid employment. Similarly, Awsumb et al. [4] qualitative study with parents, educators, and agency staff ($n = 74$) found that lack of soft skills (e.g., motivation, personal hygiene) were significant barriers to acquiring early employment for transitioning youth. The exploratory use of the MAS in the project focused on the self-reported level of capacity in nine soft skills as predictive domains for obtaining and retaining employment. Seeing positive changes in the project's MAS soft-skill domains underscored these soft skills as important growth areas related to employment. The present study reflected changes in soft skills between T1 and T2, indicating a statistically significant increase in eight out of nine domains (Table 3). Similarly, Schall et al. [26] reported "findings from a multisite randomized clinical trial measuring the impact of employment on independence in 18- to 22-year-old youth with … autism spectrum disorder (ASD)" (p. 301). Schall et al. [26] reported significant improvements in all soft skill domains for their participant group, against limited improvement for individuals with ASD in the comparison group (p. 308); a finding mirrored in the current study.

Research by Schall et al. [26] confirmed the importance of active engagement among participants. Our program evaluation likewise found that the employment specialists' recorded degree of participation was positively correlated with employment scores at T2 and T3, and four MAS soft skill domains. The degree of participation was positively associated with higher scores in those four soft skill domains that serve as predictors for future employment. This result aligns with findings reported by Inge et al. [27], who established "that work participation collaterally impacts growth in other major life areas beyond just employment for youth and young adults with IDD" (p. 489).

Other program evaluation results presented an unexpected departure from some of the research literature in which employment-related transitions for youth with IDD have been described as a disparate gendered experience (e.g., [8,28]). Although isolated Project findings from cohort 1 in 2020 demonstrated some gender disparities with male identifying youth gaining more paid employment, this finding was not repeated in findings for cohorts 2 and 3 in 2021 and 2022, or in the analysis of the complete sample. An analysis of gender-based differences did not present statistically significant results or overall limitations to employment across the three years of the project. Both those who identified as male and female, the two biggest groups in a gender-based analysis available for this program evaluation, gained substantial unpaid and paid employment where gender-based differences did not affect paid and unpaid employment gained, nor the observed youth involvement in vocational activities and training. This could

be explained by the iterative feedback and ongoing discussions of gender-based disparities that took place between the research team and project partners after cohort 1. These discussions may have positively influenced the employment specialists' engagement and youth-centered activities offered to female identifying youth.

Other research results specific to the youth's self-identified "level of disability" in the LSI and employment experiences aligned with research findings from Barnard-Brak et al. [29]. Both the Impact Project and this U.S. based study found "the participants' severity of impairment in intellectual and adaptive behavior *not* significantly correlated with community employment outcomes" ([29], p. 120). According to the 2023 study, predictors of employment for adults with intellectual disabilities participating in a post-secondary transition program suggested that the interaction of job-related skills and job-specific tasks was most predictive of community employment. A lack of statistically significant correlation between the current study's LSI and employment scores similarly indicated that "severity of impairment" did not limit the youth in participating or obtaining employment, suggesting the importance of youth-centered methods in vocational training and activities.

Limitations

Apart from the strengths highlighted by this program evaluation, there were several limitations. As specified, the size of the comparison group limits the comparisons that can be made between the two groups and affects the generalizability of the findings. Youth-centered and community-based research presents limitations to the generalizability of research results. The project took place within a specific regional context, which may limit the applicability of the findings to other regions with different social and economic contexts. A youth- or person-centered approach limits the generalizability of results, while this approach itself provided the project's strength. With the data collected, it is difficult to definitively conclude that solely the transition programming led to improved employment outcomes. However, results show that program participation and employment outcomes were positively related in statistically significantly ways.

There was a level of self-selection among those participating in the project hinting at selection bias that limits the generalizability of the findings. Recruitment through school districts, the youth their preparedness to participate, and their parents or carers willingness to have their youth participate informed the sample. Self-selection bias was an anticipated consideration in the Project. While this means the sample is not a random sample and limited in the generalizability of findings, the community-based Impact Project prioritizes depth of engagement, relational accountability, and a co-production of knowledge with community partners over statistical representativeness. The sample was predominantly male, reflecting broader societal patterns in the diagnosis of developmental disabilities, which tend to under-identify girls and gender-diverse individuals, limiting the generalizability of findings.

As discussed in the design, the community-based nature of the project included the co-production of research measures with community stakeholders. As such, the program relied on exploratory research measures presenting a limitation to the academic validation associated with tested and validated psychometrics of other measures. Nevertheless, these exploratory measures meant tools used were of value to project partners, providing practical and effective insights for the various stakeholders and allowed for the inclusion of project partner feedback to better record the youth experiences in future cohorts.

Most of the operational limitations were COVID-19 related. The project had to adapt and adjust programming to online or COVID-19 regulated formats in 2020 and 2021. Some project partners reported that youth had a hard time engaging either in its adapted format, or due to the mental strain and fear COVID-19 brought along. Regardless of COVID-19 limitations, results provided evidence for the value of youth-centered vocational training as a viable means for producing overall positive employment experiences for youth with IDD. For some, the online vocational training increased comfort and engagement with employment specialists, hinting that the method of contact was less important than the time spent either in-person or online.

The current article only addressed some quantitative results of the ongoing Impact Project, without incorporating qualitative results. These valuable insights into the effectiveness of the project are addressed in a separate publication.

Future directions

Future iterations of the Impact Project expand the research focus to establish potential best practices in vocational training in supporting transitioning youth with IDD. While the current evaluation underscored the importance of youth-centered vocational training for employment experiences, next cohorts explore best practices within vocational training as established in research in the context of Ontario, Canada [5]. Future iterations also increase the number of project partners from eight to ten, incorporate more gender-based analyses of employment, and provide more data for concrete recommendations for practitioners, policymakers, and community-based research.

This program evaluation provides indications of importance for furthering developmental strategies in community and industry to support youth in transition to employment. Such strategies could emphasize youth-centered vocational training tailored to the individual strengths and interests to promote youth participation, employment-related soft skills, and overall employment experiences. This study reports that youth gained more employment experiences following their participation in the project whereas the comparison group did not. Comparisons between groups suggested that the vocational training positively impacted employment experiences and MAS soft-skill domains. Without the project partners' youth-centered vocational training, youth displayed little change in their employment experiences or MAS soft-skill domains as predictors of future employment.

In conclusion, this article communicated empirical evidence from the Impact Project (between 2020 and 2022) in which eight-member organizations of the BCEN showed that providing youth-centered vocational training for youth with IDD positively increased employment experiences. The concurrent mixed methods and formative evaluation design of the project addressed low employment rates among individuals with IDD in BC and results confirmed positive changes in the youth's soft skills and paid and unpaid employment experiences.

What this paper adds

Findings suggest person-centered vocational training and activities for youth with IDD improve employment experiences that can serve as a predictor for future employment outcomes.

Notes

1. Seventy-two youth could not be reached by their employment specialists for T3 due to the later addition of the T3 surveys after the first pilot cohort in 2020. The main characteristics of the 72 youth who could not be reached by the agencies at T3 were similar to the 207 youth that completed T3. Therefore, comparisons across T1, T2, and T3, while only made for 207 youth in the participant and comparison groups could be tentatively extended to the whole sample.
2. 8 missing.
3. 8 missing.
4. 1 missing.
5. 2 missing.
6. 1 missing.
7. 1 missing.
8. 2 missing.

Author contributions

Laura Mudde: software, validation, formal analysis, investigation, data curation, writing–original draft, writing–review and editing, and visualization. R. Colin Reid: methodology, software, validation, formal analysis, data curation, writing–review, and editing. Rachelle Hole: conceptualization, methodology, resources, supervision, funding acquisition, review, and editing.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This project was funded by the Ministry of Social Development and Poverty Reduction in a partnership between UBC's Canadian Institute for Inclusion and Citizenship and the BC Employment Network.

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