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Promoting disability employment with avail® – a pilot study for feasibility and preliminary efficacy

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ABSTRACT

Purpose: Supported employment is a promising vocational rehabilitation intervention for improving disability employment. Its implementation, however, is not without challenges. Lack of funding and the heavy caseload of job coaches significantly constrain its impacts. A mobile software, avail® by CentralReach, was created based on the individual placement and support model for assisting individuals with disabilities to perform their job tasks. The purpose of this pilot study was to explore the feasibility and preliminary efficacy of avail.

Method: A total of 17 participants with disabilities were recruited in a Midwestern state from the United States to try avail for a period of time ranging from 40 to 348 days. Participants' experiences, including perceived usability, acceptance, and satisfaction, were collected to determine the feasibility of avail. In addition, a pre- and post-intervention analysis was conducted to identify its effects on users' job satisfaction, self-efficacy, and self-determination.

Results: Participants of this study expressed positive user experience for avail. Specifically, they felt that avail was helpful for their job performance. The results also showed a statistically significant result for improving participants' self-determination.

Conclusion: avail is a feasible and potentially promising application for assisting workers with disabilities in their job performance. Directly available on mobile devices, avail has several advantages, such as real-time support and good portability. Suggestions and future directions were discussed for further software development.

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Assistive technology; supported employment; vocational rehabilitation; disability; software

➤ IMPLICATIONS FOR REHABILITATION

- A job coach is needed in the individual placement and support model (IPS) to provide on-site job support for individuals with disabilities. However, job coaches were typically overwhelmed by the heavy caseloads.
- A job coach application such as the avail was created, and this study was to test its feasibility and preliminary efficacy.
- The study showed that avail was appropriate for individuals with disabilities to use at work, and they generally enjoyed using the application.
- The preliminary efficacy showed that avail improved their job performances and overall self-determination.

Introduction

The employment rate for people with disabilities has been disproportionally low, compared to those without a disability (19.1% versus 63.7%), according to the United States Department of Labour [1]. Whereas employment represents only a part of daily life, it strongly predicts an individual's independent living, mental and physical health, and overall quality of life [2]. Vocational rehabilitation (VR) bears the capacity to close this ever-widening employment gap [3]. Among many services VR provides, supported employment (SE) was found to be one of the most promising interventions for those with the most severe disabilities, such as mental illness and developmental and cognitive disabilities [4–6]. Specifically, SE was evident in improving positive outcomes such as higher rates of competitive employment, fewer days to the first competitive job, more hours and weeks worked, and higher wages [7,8].

Among models of SE, the individual placement and support (IPS) have been found to be particularly useful for individuals with severe disabilities such as intellectual and developmental disabilities [9]. IPS bases its foundation on principles including competitive employment, rapid job search, integration of rehabilitation and mental health, attention to consumer preferences, continuous and comprehensive assessment, and time-unlimited support [10]. Typically, a job coach or employment specialist (we use these two terms interchangeably for the purposes of this study) is appointed to provide individualized services such as on-the-job evaluation, training, and follow-along support [9]. In a qualitative study, Blitz and Mechanic [11] found that these

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functions of a job coach are keys to obtaining and maintaining competitive employment.

While IPS is a promising VR strategy, its implementation is not without challenges. First, service accessibility can vary due to the shortage of funding. Mueser and Cook [12] illustrated that a fully implemented SE program can be expensive. With the funding constraint, some programs may choose to prioritize IPS service only to persons with the most significant disabilities while leaving out others. As Becker et al. [13] reported in their study, the access rate for SE service was as low as 2% in some extreme cases. Second, the size of the caseload of a job coach can be overwhelming. In some cases, a job coach has to supervise more than 20 cases at the same time [14], which is above the ideal caseload suggested by the IPS Fidelity Review for quality service delivery [15]. The heavy caseload of a job coach not only jeopardizes the efficacy of IPS but also contributes to personnel burnout [16].

Observing the need, researchers have been devoted to exploring alternative forms of SE [17–19]. Many electronic options such as digital reminders or electronic prompters are now available to accommodate different needs. As Lord et al. [20] illustrated, technologies bear great potential to facilitate IPS implementations by providing online personnel training, enhancing collaborative planning and communication, improving self-management, and streamlining data management. Whereas these potentials are encouraging, Lord et al. [20] concluded that the use of technology in IPS and the analyses of its impact are still in their infancy. Indeed, there is no technology to date designed specifically to aid the IPS delivery. In response, a mobile electronic job coach software, avail, was created in 2017 with a design directly mimicking the on-the-job support function of a job coach. Although the concept of its design is promising, its feasibility has not been tested. In this study, we aimed to introduce avail to individuals with disabilities who are employed with the support of a job coach. The goal of this pilot study was to explore the feasibility and preliminary efficacy of avail. Specifically, we asked

1. What is the perceived feasibility and acceptability of avail from the users with disabilities?
2. What is the perceived feasibility of avail from the facilitator?
3. What is the preliminary efficacy of avail in promoting job satisfaction, self-efficacy, and self-determination?

Avail®

avail is a software application available on both Apple iOS and Android mobile devices. Originally, avail was designed to help individuals with autism and intellectual and developmental disabilities to accomplish goals related to job readiness skills, on-the-job work tasks, and independent living. With the purpose of facilitating IPS, avail helps individuals with disabilities perform their job tasks *via* picture/video/audio/text prompting systems. Because of the portability of a mobile device, persons with disabilities can carry it with them at work. When they encounter a complicated task, avail can provide hints for appropriately performing such a task. The design of avail is based on principles inherited from applied behaviour analysis (ABA), video modelling, and universal design approaches. Specifically, there are three advantages of using avail compared to traditional job coach approaches. First, avail provides a multi-sensory prompting system (picture/video/audio/text) to accommodate different learning styles. Second, users themselves can be included in the videos or pictures prompting cues. This is particularly useful because the individuals can see themselves, instead of others, perform a given task. When the individuals complete a given task without missing steps, avail can provide immediate feedback that positively reinforces the behaviours. Third, the prompts provided by avail can be on an immediate and on-demand basis and repeated as many times as the individuals need.

To manage users, three account types are available in avail: learner, facilitator, and manager. Learner pertains to the individuals with disabilities who will be using the application to improve their work performance. Facilitator pertains to the practitioners who will monitor learners' progress and using experiences. For example, facilitators can track how often and how long the learners engage in certain tasks. Facilitators work in partnership with learners to create their learning content. Usually, one facilitator can supervise many learners at the same time. In our study, two facilitators (one from each of the two private non-profit community rehabilitation organizations) were assigned to supervise seventeen participants. Manager account has the highest accessing rights of the three. Besides what facilitator accounts can do, managers can export all learners' data within the same organisation. This is useful when there are multiple facilitators supervising learners in an organisation.

After the learner logs in to avail on their mobile device with their own account and password, the main dashboard will show up on the screen (see Figure 1). This is a place where the learner can organise their tasks based on the locations. For example, house chores can be included in the "Home" folder, and job-related activities can be included in the "Work" folder. In addition to folders, the main dashboard may contain daily reminders as well. For example, facilitators can help learners create a message "You Are Strong!" to remind them to speak up and self-advocate. Each task can be further broken down into one or more steps. For example, a participant from this study worked in an assembly line and created three steps to help the process: 1) checking the weight of the parts on a scale, 2) putting them in a zip bag, and 3) dropping them in the collecting bucket. These steps can be in text, picture, audio, or video formats, and the prompts can be reduced when the learner develops mastery over the steps to help the learner become more independent in completing the task. In addition, if necessary, a timer can be used to remind the learner that a given step is time sensitive and must be done within the time limit.

Method

Participants

In total, 17 adults with disabilities participated in this study. All participants worked in a part-time position ranging from five hours per week to 20 h per week. The majority of the participants were male ($n = 10$; 58.82%), White ($n = 11$; 64.71%), and attended high school ($n = 8$; 47.06%). Most of the participants have a diagnosis of developmental disabilities ($n = 15$; 88.23%); one participant has a traumatic brain injury and the other has a learning disability. Participants, on average, used avail for 135.75 days ranging from 40 to 348 days. Detailed participant demographics can be found in Table 1.

Procedure

Upon approval from the institutional review board, research invitation letters were sent to two private community rehabilitation providers (CRPs) located in a Midwestern state in the United States serving people with disabilities for their vocational rehabilitation. The case managers of these two CRPs helped identify and recruit potential participants who were a) 18 years old or above,

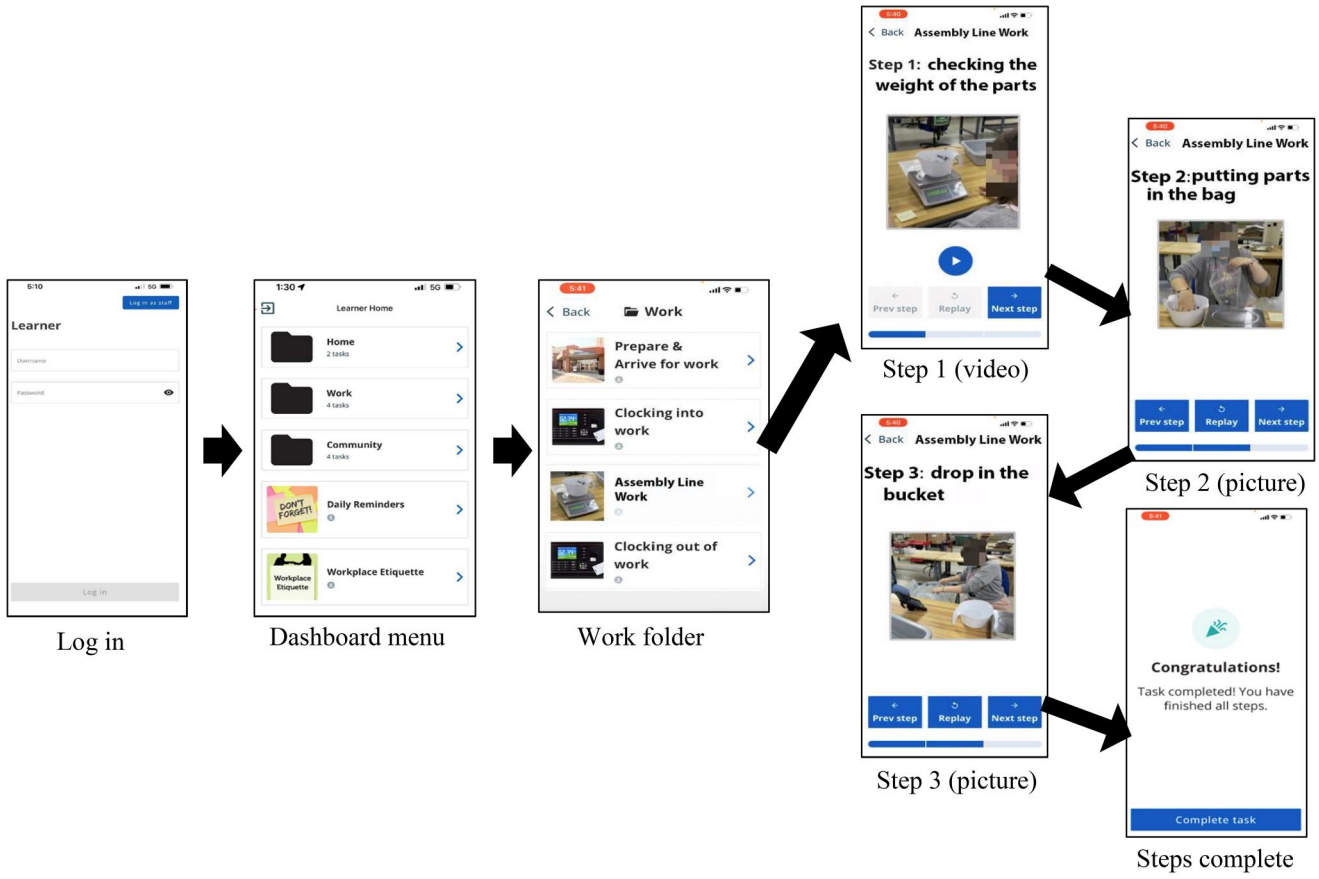

Figure 1. Avail tasks and steps.

Table 1. Participants demographics ($N = 17$).

	N	%
Gender		
Male	10	58.8
Female	7	41.2
Age: *M (SD)*	25.33 (12.70)	
Race		
White	11	64.7
Black	3	17.6
Others or no response	3	17.6
Disability Type		
Developmental Disabilities	15	88.2
Traumatic Brain Injury	1	5.9
Learning disability	1	5.9
Work Type		
Janitorial/Custodial	9	52.9
Manufacturing	5	29.4
General Labor	2	11.8
Others	1	5.9
Work Shift		
Full-time	1	5.9
Part-time (20 hrs/week)	7	41.2
10 – 20 (hrs/week)	4	23.6
>10 (hrs/week)	5	29.4

b) with a disability, and c) in the supported employment program. The potential participants contacted their case managers for their interest in participating and were led through the informed consent process. Upon obtaining the agreement, participants were orientated with the detail of the study and the instruction of the mobile device and the avail software. Participants were instructed to complete an online survey system (i.e., Qualtrics) prior to the use of avail for their baseline assessment. In each of the two CRPs, there was a facilitator assigned to create learning content on avail for the participants. These two facilitators were selected because of their training background in vocational rehabilitation and that they are proficient in operating technology. In addition, they do not have a caseload as case managers so that they do not have specific bonds with any participant. The two facilitators helped facilitate, troubleshoot, and track participants' use of avail. To ensure the fidelity of the procedure, the researchers provided a checklist for the two facilitators to create content and administer pre- and post-intervention assessments. The researchers also met with these two facilitators monthly to ensure the fidelity and consistency of the procedure and to provide extra support when needed. While each of the participants' licenses for the avail software was set to be expired in a year, they could choose however long they would like to use the software. The flexibility was to accommodate the different needs of these participants. For example, some may require more intense and longer support, while others may only need the software at the beginning of trying a new task. Reasons for discontinuing the use of avail were recorded. The actual length of using avail from each participant is detailed in Table 1. Post-intervention assessments were administered to the participants who finished their trials either at the end of the one-year mark or when they decided to discontinue the use of avail.

Measure

Being a pilot study, the objective of this study was to explore the feasibility and preliminary efficacy of avail. Particularly, feasibility tests focused on usability, acceptability, and satisfaction of the participants for their avail using experience; preliminary efficacy tests focused on whether avail helped improve their job

satisfaction, occupational self-efficacy, and self-determination. In addition, qualitative feedback from the two facilitators were gathered to explore their experiences as a facilitator. Specifically, a form was used to gather their perceptions on easiness and training requirement for managing users, creating learning content, and operating avail.

Usability

The System Usability Scale (SUS) [21], a ten-item inventory, was used to measure participants' perceived usefulness of avail. The usefulness is determined by how often the participants used the application, how easy it was for the participants to use the application, and how much learning the participants needed to use the application. Participants rated on a 5-point Likert scale for each of the statements from (0) strongly disagree to (4) strongly disagree. Of the ten items, half of the statements are worded positively, and the other half are worded negatively. The total score is calculated by summing up all ten items and then multiplying by 2.5 to convert to a 0 -100 score. A score of 68 or above is considered above average for usability.

Acceptance

Technology Acceptance Model (TAM) [22], a twelve-item inventory, was used to measure participants' perceived acceptance of the technology. Two subscales, with six items each, are designed to capture participants' perceived usefulness and ease-of-use of the intervention (i.e., mobile device and the avail software). Participants rated on a 7-point Likert scale for each statement from (1) extremely disagree to (7) extremely agree. The total score is calculated by summing up items from the given subscale. The reliability of TAM was reported to be appropriate for both perceived usefulness subscale (Cronbach alpha = .98) and the perceived ease-of-use subscale (Cronbach alpha = .94).

Satisfaction

Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) [23], a twelve-item inventory, was used to measure participants' satisfaction with the use of the assistive technology. The first eight items were used to measure participants' satisfaction with the assistive device; the remaining four items were used to measure participants' satisfaction with the associated services. Each item was rated on a 5-point Likert scale from (1) not satisfied at all to (5) very satisfied. The reliability was reported to be appropriate for both the assistive device subscale (Cronbach alpha = .80) and the service subscale (Cronbach alpha = .76) (Demers et al. 2002).

Job satisfaction

Job Satisfaction of Persons with Disabilities Scale (JSPD) [24], a fourteen-item inventory was used to measure participants' perceived job satisfaction. Two subscales are included in the JSPD with nine items for intangible benefits (e.g., my job is good for my lifestyle) and five items for tangible benefits (e.g., I have a job with good pay and benefits). A six-point Likert scale was used from (1) strongly disagree to (6) strongly agree. The reliability was reported to be high for both the intangible benefit subscale (Cronbach alpha = .96) and the tangible benefit scale (Cronbach alpha = .76).

Self-Efficacy

Occupational Self-Efficacy Scale (OSSS) [25], an eight-item short-form inventory, was used to measure participants' perceived ability to complete the work tasks. Example questions include "When I am confronted with a problem in my job, I can usually find several solutions." A six-point Likert scale was used from (1) strongly disagree to (6) strongly agree. The reliability was reported to be high for the scale (Cronbach alpha = .87).

Self-Determination

The Arc's Self-Determination Scale [26] was used to measure participants perceived capacity to make their own decisions for their life. The original scale is a 72-item inventory that consists of four subscales including autonomy, self-regulation, psychological empowerment, and self-realization. For the purpose of this study, a short form was used that only uses three of the four subscales (i.e., autonomy, psychological empowerment, and self-realization). For the autonomy subscale, fifteen items were used on a six-point Likert scale from (1) strongly disagree to (6) strongly agree; for the psychological empowerment subscale, six items were used on a binary scale; for the self-realization subscale, five items were used on a four-point Likert scale from (1) strongly disagree to (4) strongly agree. The reliabilities were reported to be appropriate for the autonomy subscale (Cronbach alpha = .90), psychological empowerment subscale (Cronbach alpha = .73), and self-realization subscale (Cronbach alpha = .62).

Data analysis

With a small sample size and the nature of a pilot study, the intention of the quantitative analysis was not to validate the true effect of the application, but to explore possible trends. Descriptive statistical analyses were conducted to understand the feasibility of the intervention, and the paired t-tests were conducted to capture the differences between pre- and post- avail implementation. Statistical Package for Social Science (SPSS) version 24.0 was used to conduct the analyses. No statistical adjustments were applied to the analyses due to the small sample size and exploratory nature of the study. The qualitative information gathered from the two facilitators was not further analysed but directly reported.

Results

Participants, on average, used avail for 135.75 days ranging from 40 days to 348 days. Two participants used avail less than a month (both used avail for 16 days). After explorations, both participants discontinued the study due to reasons that were not directly related to the use of avail (e.g., terminating their rehabilitation program). These two participants' results were then excluded from the final analyses. As a result, a total of 17 participants completed the study. Amongst the 17 participants, a total of 44 tasks were generated for various purposes. Tasks range from job preparation tasks such as a reminder for clock-in and clock-out for the work shift, to job-specific tasks such as cleaning tables and chairs for janitorial jobs and counting garments for apparel manufacturing jobs. In addition, there were also non-job-related tasks generated for assisting participants' mental health such as a prompt for a two-minute meditation. These tasks were generated either because they were new to the participants or if the participants requested for them to be created. On average, there were 3.73 steps created for each task ranging from one to 21 steps. Of these steps, 34 were created in picture formats, 15 were in video formats, and 13 were in audio-only formats. These format selections were decided by the participants. Of the 17 participants, six used avail on a smartphone, and 11 used it on a tablet (e.g., iPad or

Android tablet). Participants can choose to use avail on their self-owned smartphones or tablets provided by the two CRPs.

Feasibility

Usability

After reversing the scores for those negatively worded items in the SUS, higher scores can be considered as better perceived usability. On a 0 – 4 scale, all ten items were rated above mid-point with an average of 3.25 ($SD = .78$), ranging from 2.82 ("I think that I would need the support of a technical person to be able to use avail") to 3.76 ("I thought there was too much inconsistency in avail"; the score was reversed due to the negatively worded item). After calculating the sum score according to the SUS manual, the total score from the participants is 81.18 on a 0 – 100 scale, which is above the suggested cut-off score of 68 – representing that avail can be considered as above average for usability.

Acceptance

Of the six items included in the perceived usefulness subscale from the TAM, the average rating was 4.93 (SD = 1.23) ranging from 4.69 (SD = 1.14) for the item "using this product in my job enables me to accomplish tasks more quickly than other products in its class "to 5.25 (SD = 1.44) for the item "I have found this product useful in my job." Of the six items included in the perceived ease-of-use subscale, the average rating was 5.22 (SD = 1.38) ranging from 5.13 (SD = 1.41) for the item "I found this product to be flexible to interact with" to 5.38 (SD = 1.41) for the item "learning to operate this product was easy for me." Overall, every item was rated above 4 on a seven-point scale, which represented a high acceptance for avail.

Satisfaction

The first eight items of the QUEST were used to measure the perceived satisfaction of the assistive technology – the mobile device on which the participants use the avail. Participants have an average of 3.99 (SD = .68) ranging from 3.81 (SD = 1.05) for the item "please rate your satisfaction with regard to the ease in adjusting the parts of your device" to 4.38 (SD = .72) for the item "please rate your satisfaction with regard to how safe and secure your device is." For the perceived satisfaction of the service – the avail app, participants rated an average of 3.81 (SD = .67), ranging from 3.56 (SD = 1.03) for the item "the services you received (procedure, length of time) to use your device" to 4.00 (SD = .89) for the item "the quality of the professional services (information, attention) you received for using your device." Overall, every item was rated above 3 on a five-point scale, which represented a positive satisfaction from participants.

Table 2. Preliminary efficacy T-test.

Preliminary Efficacy Scale	Pre-Test		Post-Test				Effect
	Mean	SD	Mean	SD	t-test	*p*	Size
Job Satisfaction Intangible	45.88	6.31	47.29	5.17	.73	.48	.18
Job Satisfaction Tangible	22.47	3.00	23.06	3.42	.59	.56	.14
Occupation Self-Efficacy	32.71	5.24	34.94	5.86	1.18	.26	.29
Self-Determination Autonomy	68.06	8.86	68.29	11.53	1.56	.14	.38
Self-Determination Empowerment	3.65	.79	4.78	.73	2.31	.03*	.56
Self-Determination Self-Realization	16.35	1.62	16.53	2.53	.29	.78	.07

Significance: *<.05.

Preliminary efficacy

A series of paired t-tests were performed, and the results can be found in Table 2. Although positive trends were observed on all measures, only the self-determination empowerment subscale was statistically significant with a $t(16) = 2.31$, $p = .03$ with a medium effect size (Cohen $d = .56$)[27].

Facilitator qualitative feedback

The facilitators were asked about their perceptions of the easiness and training requirements for using avail, and if they have any suggestions for enhancing user experience. Both facilitators considered avail to be an easy application to use. Depending on specific functions of the application, some training may be required before a facilitator can operate it smoothly. Details of these results can be found in Table 3. One facilitator pointed out that the immediate reward, which is natively available in avail, was particularly helpful to the participants. She said, "the reward feature is useful at the end of a completed task. Facilitators can ask learners what they would like to view as a reward for completing a task. Their request for a photo of a favourite sports team or a video from a co-worker or supervisor saying, "keep up the good work" etc., served as a unique opportunity to offer individualized positive reinforcement."

Discussion

People with disabilities continue to face employment disparity despite legislative efforts and vocational rehabilitation endeavours. Interventions such as IPS evidently bear promising effect for battling this disparity [6,28]. However, a fully implemented IPS is not an easy task. As Waghorn et al. [14] illustrated, dedicated job coaches are essential to carry out the IPS implementation. With the unbalanced demand and supply, most job coaches have to supervise a sizable caseload. This does not only limit the effects of the supported employment intervention, but also contributes to staff burnout and higher turnover rate [16]. avail is a mobile-based application designed with the IPS model in mind to serve as a digital on-demand job coach that guides and prompts individuals with disabilities to perform their job tasks. To establish its feasibility and preliminary efficacy, we piloted the avail with 17 individuals with disabilities.

Feasibility

Whereas assistive technology (AT) is generally considered a positive force for enhancing independence, work capacity, and quality of life of individuals with disabilities, it is not a panacea [29]. The high AT abandonment rate has been a prevalent challenge for decades [30–33]. As Scherer [34] illustrated in their matching person with technology model, an AT solution that focuses only on functional consideration, but overlooks users' preference, will eventually find itself in the scrapyard. avail, being an assistive technology application, is no exception for this challenge. Participants of this study used their avail either on a smartphone or a tablet. This provides two advantages. First, most participants are familiar with how to operate a touchscreen mobile device. Hence, it requires almost no extra training for the participants to operate the device. Second, the mainstream of a mobile device may help avoid unwanted attention. As Kuo et al. [35] pointed out, a common AT abandonment reason is that it can be stigma provoking. For most people, using a smartphone or a tablet has become a daily routine, and as such, using avail is not likely to

Table 3. Facilitator feedback.

Areas	Training Required?	Easiness
Managing Users	• Minimum training (approximately 30 min) may be required to understand the managing mechanism fully.	• It takes only a couple of minutes to add a new learner. • It is straightforward to activate, inactivate, create new accounts, edit existing accounts, etc.
Creating Content	• One to two hours of training is needed for a new facilitator to learn how to create content in avail (doing a task analysis/breaking down the steps, learning the different prompts available, determining which type of prompt is best, using in-app rewards). • Once a facilitator learns the process, it becomes faster and easier.	• Content creation is easy (an intuitive process); however, it takes time and effort to build highly individualized content (which is best). • Uploading photos/videos directly from the content library makes it easy to develop applicable content. • The initial content creation takes the most time. Once a task is created, editing it is quick and easy.
Operating the Application	• Approximately 30 min of training may be needed to show each learner how to open the app, log in if they get logged out, how to play each task, how to move to the next step, and how to replay a step if needed.	• Very easy to navigate the interface. • The learner dashboard includes thumbnail photos of each task for easy recognition and selection (touch the task they want to watch). • Menus are easy and intuitive.
Future Suggestions	• Currently, video clip only allows for 15 s. A longer video will be helpful. • Voice control so that a learner can say "next step" rather than having to touch the screen. Some participants worked in settings (e.g., custodial, food serving) where they wore gloves while working and had to remove gloves to touch their iPad and advance to the next step. • Allow learners to create their own learning content. Maybe allow them to keep notes, create a to-do list, or have other reminders. This allows them to engage more with the application. • This application subscription is annually based. Maybe a six-month license option will be helpful, as not everybody needs it for a year. More price options will allow family or group homes to use the application without too much financial burden.	

attract unnecessary attention. These benefits reflected on the results of this study, in which participants rated high in aspects including device satisfaction and ease-of-use.

It should be noted, however, that the convenience of mobile devices can quickly turn into a distraction when used without supervision. As Darcy et al. [36] aptly pointed out, the multifunction nature of a mobile device can divert AT users' attention and cause unnecessary distractions. Although we did not experience such a distraction from our participants, we argue that for a mobile application such as avail to be helpful, a more controlled device should be used. For example, both Android and iPhone/iPad devices have a function called "guided access" which pins the screen to a single application and limits all other functions. This will significantly reduce the distractions from the mobile devices. To strike a balance between convenience and distraction-free, practitioners will need to take an individual-based consideration for technology implementation. As for the experience pertaining to avail specifically, participants also gave positive rating for avail's perceived usefulness and service satisfaction. This indicated that the users not only considered using avail at work makes sense and not cumbersome, but also help them perform the job tasks. It should be noted that the rating was perception-based and had nothing to do with actual performance. Hence, it is important to explore other efficacy indicators.

Preliminary efficacy

Although we observed improving trends in all aspects, including job satisfaction, occupational self-efficacy, and self-determination, most of these measures were not statistically significant. This may be due to a variety of reasons. First, the sample size was small due to the nature of a pilot study. Having observed the positive trends, future research should increase the sample size to capture a more meaningful result. Second, the short period of the study may limit impactful results to be observed. For example, in the measure of tangible job satisfaction, the term "tangible" pertains to salary increase or promotion. Although these types of improvements are not impossible, they may require more time to manifest. Therefore, a follow-up measure is desired for future studies.

Most participants worked under the supervision of a job coach before participating in this study. These job coaches sometimes may need to supervise more than one individual at the same time, as described by Waghorn et al. [14]. Therefore, workers with disabilities may not receive help from their job coaches immediately following their request. The waiting for help may subsequently contribute to the feeling of dependency. By using avail, these individuals were able to receive task-related help instantaneously when they needed. We argue, however, that avail is not a replacement for the job coach because avail can only help with pre-determined challenges such as work-related tasks. In a workplace, many unexpected challenges (e.g., disagreement with co-workers, and angry customers) can occur, and a job coach can intervene accordingly. Nevertheless, an application such as avail can help ease the load of a job coach. In addition, as the facilitators pointed out, although using avail and managing users was easy and intuitive, creating appropriate learning content may be more time-consuming and require some training to master it. Therefore, whereas avail may ease the load of a job coach, they will need to learn how to use it and create content.

It Is clear that avail can promote the self-determination of workers with disabilities. Specifically, the self-determination empowerment subscale was robust and yielded a significant result ($p < .05$) with a medium effect size (Cohen $d = .56$). Indeed, the participants felt more capable of making decisions and completing tasks on their own following the use of the avail. Whereas the long-term inferences are still to be investigated, it is promising and encouraging. As numerous studies suggested, self-determination skills are indicative of successful outcomes such as academic achievement [37], job satisfaction [38], and ultimately, quality of life [39]. Di Maggio and colleagues [38] aptly pointed out that when people are given the opportunity to exert their self-determination, such as making their own decisions and expressing their feelings, multiple psychological needs (i.e.,

autonomy, competence, and affiliation) can be fulfilled at the same time. The fulfilment of these psychological needs may further influence how individuals feel about their jobs. Although our study was not long enough to observe the same result, we suspect the same, and the expansion of this study is warranted.

Scaling avail

A fully executed IPS can be expensive, both from the cost and labour force perspectives [12,14,16]. As described earlier, these constraints prohibit IPS from having a broader impact across disability types and severities. Technology designed specifically for IPS, although still in its infancy [20], bears great potential to meet the need. avail was one of the first creations for the purpose and can be used by any company or rehabilitation agency. Although the affordability and scalability of using such a tool can be subjective for each individual and company, we would present the cost here as a reference. First, the avail app can be obtained for free from the AppStore for iPhone/iPad users or Google Play for Android users. Since avail is a cloud-based application, all the content and data are saved remotely. Therefore, individuals do not have to worry about losing data or changing devices. A subscription is required at a rate of $800 US dollars per person per year. In addition, it should be noted that a facilitator is required to create learning content for users, although a facilitator can manage multiple users. A facilitator license is $500 US dollars per account per year. If the organisation is new to avail, there is a one-time onboarding training required for facilitators/managers to attend. The one-time training fee is $1,750 US dollars for the entire organisation. Lastly, since the completion of this study, a newer version of avail (2.0) was announced with some user interface improvements and new features. More updated information can be found at http://availsupport.com.

Limitation

The aim of this study was to understand avail's feasibility and make sure that it would not cause any adverse effects on users. Given the exploratory nature of the pilot study, a quasi-experimental design was used. As a result, there are a few limitations inherited from the selected methodology. First, most of the selected measures relied on users' self-report, and were not directly involved in their actual work behaviours. The perception-based measurements could suffer from individual biases. In addition, although the preliminary efficacy results were encouraging, whether they translate into real-world performance is still to be tested. Second, the small sample size limits the generalizability of the results.

For further validating the efficacy of the avail, a few research designs can be considered. First, a more homogeneous sample can be recruited. As with any intervention, the one-size-fits-all approach may not meet the diverse needs and learning styles of each individual. Therefore, a more controlled sample would be beneficial to establish best practices for certain groups. Second, research that compares traditional and technology-assisted IPS can be helpful, not only from the efficacy perspective but also from the cost-effective analysis angle. The results will inform business and rehabilitation agencies to decide the usability and scalability of the intervention. Third, whereas a true experimental design may be challenging for the purpose, a waitlist research design can be utilized to verify its true effect. Finally, whether the avail can improve the employment rate of individuals with disabilities is yet to be studied. Our participants were employed prior to the study. A study that verifies the employment rate improvement will likely invite policymakers and stakeholders to invest and support an application like avail.

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