

Creating a Digital Bridge: Lessons and policy implications from a technology access and distribution program for low-income job seekers

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Abstract

In the United States, lower income households are significantly less likely to have a computer or internet at home and were disproportionately impacted by the historic job losses in the Spring of 2020. In response, a Seattle-based workforce development nonprofit in partnership with the City of Seattle launched a program called Digital Bridge and distributed 197 refurbished computers and 174 internet hotspots. Program participants also had access to Northstar Digital Literacy Assessment, online curriculum, and a technical support phone line. To understand Digital Bridge recipient needs, program impacts, and experiences of case managers implementing the program, we conducted a mixed methods study using a survey, Northstar Digital Literacy assessments, audio diaries, interviews, and a focus group.

We found that most Digital Bridge participants needed individualized training and structured support to complete online training and look for employment. Case managers became participants' default help desk without sufficient training and time allocated to properly support their clients. Participants did not use the technical support line but relied on family, friends, and their case manager when they needed assistance. Participants also wanted more structured support such as one-on-one walk throughs of their new devices and formal digital literacy training.

After the initial pandemic shutdowns, more temporary federal funding has been allocated to support digital inclusion efforts. This study found that simply distributing technology will not get someone meaningfully connected; recipients want and need assistance from programs and people that they know and trust. Organizations implementing these programs need additional funding to support the time intensive personnel costs; funding cannot be limited to distributing the technology. Additionally, programs addressing digital inequalities need to work with broader social and economic assistance programs for their participants to access living wage careers.

Introduction

When the Spring 2020 pandemic stay-at-home orders were issued in the United States, most employment, educational, and social systems either moved online or shutdown. However, not everyone was affected equally by these disruptions. In Seattle, much like the rest of the country, lower-income households are significantly less likely to have a computer or internet at home and have lower than average levels of computer-based digital skills ([Bergson-Shilcock, 2020](#); [City of](#)

Seattle, 2018; Vogels, 2021). These same households were disproportionately impacted by the historic job losses that occurred when many businesses closed (Carson et al., 2020; Parker et al., 2020). In response to these new challenges, workforce development, social service organizations, nonprofits, public libraries, and community organizations had to figure out how to assist people remotely during a time of incredible need, and when these same individuals did not have sufficient access to digital technology tools.

In response, the City of Seattle partnered with a local workforce development nonprofit, Seattle Jobs Initiative (SJI), to create Digital Bridge. The program's goals were to "offer job seekers the digital tools and skills they need to access online job training and career pathways" (Braxton, 2020). Digital Bridge provided low-income job seekers who were receiving employment case management services from SJI and community-based organizations (CBO) partners, with a refurbished laptop and a free internet connection for one year. Between July 1 and December 31, the project distributed 197 laptops and 174 internet hotspots. To assist recipients in using their new technology and to help learn digital skills, all program participants also received access to the online NorthStar Digital Literacy Assessment and curriculum, and a technology assistance support line. Although the availability of jobs was low due to local pandemic restrictions, these digital technologies could allow unemployed workers to participate in online job training and complete other essential tasks.

Digital Bridge, and similar programs across the United States ("Digital Navigator Playbook," n.d.; Roach, 2020), were experimenting with how to support new laptop users in an 100% remote environment. We wanted to understand Digital Bridge participants' existing technology skills, sources of technology support, and support and assistance needs. Additionally, we wanted to understand how CBOs' can best support these needs. We used a combination of survey, digital skills assessments, audio diaries, and interviews with participants, and audio diaries and a focus group with program case managers. Much of digital inequalities research tends to focus on individual deficits, and less on people's existing skills and resources (Eubanks, 2007) and "what works to alleviate these inequalities and divides" (Reisdorf & Rhinesmith, 2020, p. 132). We saw an opportunity to help alleviate that mismatch and provide practical recommendations for other programs and policymakers. Although some organizations have returned to offering some in-person classes and assistance, hybrid service delivery is likely to persist. Understanding these supports can inform structural program design needs, funding, and policy approaches that will best promote meaningful broadband adoption and the use of digital resources to help achieve personal goals.

Literature Review

Applying for jobs, even for low wage jobs, requires navigating complex technical processes. Online hiring as well as other essential services such as government benefits and school systems create additional barriers to individuals accessing basic, critical resources (Dailey et al., 2010, p. 514). Employers have created systems that assume a person has secure, personal space with stable electricity, sufficient internet connection, mobile phone, and a functional computer (Gershon & Gonzales, 2021). Even for those who own digital technologies and have personal access to the internet, low-income users "experience cycles of dependable instability" due to the

inability to pay or broken technology (Gonzales, 2016). Those who lack consistent access to the digital technologies needed to participate in employment and civic life reflect societal inequalities and is stratified by socioeconomic factors (age, income, and education), disability status, and race (Reisdorf & Rhinesmith, 2018, pp. 43–44). Individuals and communities should have the option to have digital technologies as part of their “set of tools for survival” for economic and social wellbeing (Eubanks, 2007).

Technology access and assistance programs

Public libraries, nonprofits, and community organizations have a history of assisting low-income individuals and communities connect to the internet and use digital technologies (Becker et al., 2010; Crandall & Fisher, 2009; Dailey et al., 2010; Rhinesmith, 2016). Most of these organizations’ activities can be classified into one of four categories: “operating public access computer centers,” “making low-cost computers available,” “providing low-cost broadband,” and “connecting digital literacy training with relevant content and services” also known as digital inclusion activities (Rhinesmith, 2016, p. 5). As individual technology use and needs increased, these organizations increased capacity to meet these needs, and in turn faced continually increased costs and the need for increased funding (Dailey et al., 2010, p. 514). However, federal policy and funding focuses more on the broadband infrastructure and less on community-based supports (Horrihan & Schement, 2021).

Infomediaries, those who use a combination of technological resources and coaching to meet someone’s information needs, often work with libraries, organizations, and community groups but may also be apart of an individual’s personal support network (Ramírez et al., 2013; Sweeney & Rhinesmith, 2017). Infomediaries are a part of the “ecology of support” needed for help someone to use the Internet; they “share social norms, practices, and processes related to using these technologies; and help...make sense of and exercise control over how broadband enters users’ lives” (Gangadharan & Byrum, 2012, p. 2602). Rhinesmith and Kennedy use the term “digital equity ecosystems” as way to describe these complex “interactions between individuals, populations, communities, and their larger sociotechnical environments that all play a role in shaping the digital inclusion work in local communities to promote more equitable access to technology and social and racial justice” (2020, p. 6). These infomediaries and organizations not only help individuals get online but support community connection and social change (Eubanks, 2007; Rhinesmith, 2012, 2016; Viseu et al., 2006).

Previous research has examined what individual and organizational attributes are needed to be successful parts of these ecosystems. At the organization level, in an examination of community hot spots run by a public library, Rhinesmith describes a “sense of comfort” vital to success that includes support, trust, (physical) safety, and respect (2012). Looking at telecentres outside the United States, Gomez and Gould describe a “perception of trust” (which includes safety, relevance, reputation, and “cool”), (Gomez & Gould, 2012). Ramírez et al found that infomediaries need to be “[embedded] within the local community” and that “empathy is absolutely necessary” (Ramírez et al., 2013). Sweeney and Rhinesmith argue that these organizations can adopt a feminist ethics of care which means emphasizing relationships where expertise is shared among infomediaries and participants and “help people express their technology needs as defined through their own lived experiences and cultural contexts” (2017).

Although having public, in-person community access is critical (Sweeney & Rhinesmith, 2017), individuals that solely rely on public access are more vulnerable to some privacy and security risks such as having sensitive financial and health information in public view and on shared devices (Gangadharan, 2017). For low-income job seekers, relying on the public library as the sole location to charge their phones, use computers, and connect to the internet puts them at a disadvantage against those job seekers with homes with consistent access to technology (Gershon & Gonzales, 2021). Pre-pandemic users were also reliant upon center hours, computer time limits, and having access to transportation and childcare.

As mentioned earlier, some digital inclusion programs help people acquire personal computers and internet connections for free or at reduced costs. For device distribution (either free or low-cost), digital inclusion programs either mass purchase new laptops or use refurbished computers (either refurbishing themselves or partnering with an established refurbisher) (Siefer et al., n.d.). Using refurbished computers has positive ecological impacts and in some cases, the refurbisher incorporates technical training for people from marginalized backgrounds (Gonzales & Yan, 2020; Rhinesmith, 2016; Siefer et al., n.d.). However, refurbished computers have shorter battery lives than newer laptop models (Dove, 2017). To assist low-income families in obtaining internet service, programs either help people enroll in wireline low-cost program or obtain wireless internet service with hotspot devices. Many ISPs offer wireline internet at lower costs for low income households as a condition of a merger (Burger, 2015.; Choney, 2011; Finnerty, 2020) but the exact eligibility criteria differs by provider (*Free & Low-Cost Internet Plans*, n.d.), and a debate exists over how much bandwidth these programs need for a household and its adequacy (Forester, 2020; Kraus, 2021; *What Internet Speed Do I Need?*, 2017; *Student Home Internet Connectivity Study*, 2021). Some organizations have offered hotspots for loan, purchase, or free distribution (Siefer et al., n.d.; Strover, 2019). Household bandwidth needs, for both download and upload, increased significantly during the pandemic with adults and children working and studying from home (Brake, 2020).

Pandemic era approaches

In response to the closure of schools and public access centers in March 2020, digital equity ecosystems expanded and shifted to include new types of organizations, new partnerships and stakeholders, shifted to online assistance and digital skills training, and identified new funding sources, sharing resources with communities, and in some cases offering outside, socially distanced events (Rhinesmith & Kennedy, 2020). Although some organizations did support personal devices and internet connections previously, this became the primary strategy to get or keep people meaningfully connected.

Since the beginning of the pandemic, a new classification of infomediary, Digital Navigators, began to proliferate (Roach, 2020). Digital Navigator roles vary slightly by institution but often include providing assistance acquiring affordable internet access and devices and provide technical and application-specific support (Schwartz, 2021). These programs are based out of (or in partnership with) organizations such as public libraries, nonprofits, community colleges, school districts, and community-based organizations (Digital Navigator Model, n.d.; “Digital Navigator Playbook,” n.d.)

Early findings from Digital Navigator and other similar efforts recommend strong, clear, consistent communications; clear, simple eligibility and enrollment requirements; and trusted sources for one-on-one assistance (Goodchild et al., 2021; Sharma et al., 2021). Findings from technology support provided to low-income Seattle Public School (SPS) households included the following recommendations:

- Families need detailed, clear care instructions to use their devices;
- Program design should not assume familiarity with district technology tools and technology-specific jargon and processes (logging on, password retrieval);
- Identify whether technology support issues are problems with devices, slow internet speeds, or being unfamiliar with specific digital skills or platforms;
- Proactively call device recipient in addition to providing a support line for families; and
- Use variety of communication methods to ensure reach to families who prefer or require a language other than English (Arai, 2020).

These Digital Navigator and other digital inclusion programs must balance the need to address individuals' immediate, pandemic-related needs with the need to invest and advocate for structural changes to reduce digital inequalities (Rhinesmith & Kennedy, 2020, p. 13). We hope that our study of the Digital Bridge program will contribute to understanding best practices from pandemic-response technology distribution efforts. At the same time, based on the literature, we know the importance of community digital inclusion supports and offer recommendations for design and policy to support people to successfully use digital technologies for their own and community needs.

Study Design

We used a combination of quantitative and qualitative methods to understand the Digital Bridge program. Data collection was conducted by the evaluation manager at SJI and researchers at the University of Washington. SJI led the quantitative data collection from program enrollees (n= 197) which included a personal demographic survey and three Northstar Digital Literacy Assessments. Northstar Digital Literacy Assessments. Northstar Assessments are collection of 14 online digital literacy assessments that cover topics from basic computer skills, Microsoft Office Suite, social media, and information literacy (*Assessment Info | Northstar Digital Literacy*, n.d.). Northstar assessments, developed by Literacy Minnesota, are widely used in adult education and digital literacy programs to measure digital skills (*Digital Blindspot, 2019; Northstar Digital Literacy Assessments*, n.d.; Siefert et al., n.d.). A downside to using Northstar to measure digital literacy (common with my digital literacy assessments) is that discrete skills are measured in isolation and not in the way that computers are used (Vaneek et al., 2020, p. 5).

Quantitative data was collected July 2020 – December 2020. We analyzed these data using descriptive statistics. See the Table 1 for an overview of the quantitative methods SJI used in this study.

Table 1: Quantitative methods

Method	Description	N=	Response rate
Demographic survey	Questions about personal descriptors such as race, income, number in household and current technology access. Collected by SJI case managers at intake or input in online form by partner CBO at Digital Bridge enrollment.	180	91.4%
Northstar Digital Literacy Assessments	Online assessment measuring digital literacy skills. Participants were encouraged to take three assessments: Basic Computer Skills (BCS), Basic Internet Skills (BIS), and Email Basics (EB). Taken shortly after enrollment.	BCS=49; BIS=33; EB=29	BCS=24.9%; BIS= 16.8%; EB= 14.7%

UW researchers led the qualitative data collection from a subset of program participants and case managers (see Table 2). With participants, we conducted audio diaries and interviews, and for case managers, we conducted audio diaries and a focus group. Enrolling in the qualitative data collection was optional for program participants and case managers. Previous research has shown audio diaries are a method to understand people’s everyday experiences even if collected over a short period of time (Palen & Salzman, 2002; Williamson et al., 2012). Diaries have the potential to provide insights into the participants’ smaller daily successes and frustrations and to see if any trends emerged over time. We used Palen & Salzman’s 2002 methods paper detailing how to collect digital technology-oriented audio diaries via voicemail as a guide to structure our data collection. Even though audio diary techniques have evolved since the early 2000s such as using voice-memos, we used voicemail since it did not rely on participants having knowledge of a particular app or require using a smartphone (Bartlett & Milligan, 2015, pp. 51–68). Although the qualitative sample is small, the audio diaries gave us deeper background and insight into individual experiences as compared to only an interview or focus group.

Due to COVID-related research precautions, we conducted all interactions with participants and case managers remotely using Zoom. Participant interviews were audio only and had participants call-in using a telephone number to allow for maximum flexibility. We collected data in October – November 2020.

Table 2 Qualitative Data Collection

Method	Description	N
Participant audio diaries	Digital Bridge program participants were asked to leave audio diaries for seven consecutive days and afterwards to participate in a phone interview. Participants received \$5 for each voicemail on a Visa Gift Card. The audio diary prompt asked participants to tell us how they used technology that day (including phones, computers, and internet), if they could do the things they needed to do, and what else would have helped them to accomplish their tasks.	15 participants, 78 total voicemails.

Participant interviews	Audio diary participants were invited for an interview. Participants received an additional \$20 for completing the interview on a Visa Gift Card, and it was sent via email or postal mail. The interview followed-up on themes in the voicemails, their experiences in the program, and their employment and technology needs and goals.	13
Case manager audio diaries	We asked case managers to leave voicemails for one work week (five days). The audio diary prompt mirrored the participant prompt.	4 participants; 12 total voicemails
Case manager focus group	The focus group was designed as a participatory design to get case manager perspectives on the structure of the program and what possible changes could be made.	3

For analysis, UW researchers anonymized the participants and created a universal codebook through iterative and collaborative thematic coding. Each data set was analyzed separately using the qualitative coding software Dedoose.

To recruit program participants for the audio diaries and interview, a UW researcher attended an orientation session for Digital Bridge program participants. If someone wanted to enroll in the study, they were encouraged to fill out a sign-up form but could also email or call the UW researcher team. This ensured that their participation would be confidential from SJI. The SJI evaluation manager also followed up via email and text message with participants with the link to the sign-up form. One SJI case manager also texted their clients with reminders about the option to enroll. For the case managers, a UW researcher attended an SJI case manager meeting, and the SJI evaluation manager distributed the information about the voicemail and focus group information to SJI and CBO partner case managers. Case manager participation was optional and confidential. All names used in this report are pseudonyms.

Our research team includes members of UW, SJI, and the City of Seattle Department of Information Technology and the Office of Economic Development. The City of Seattle funded the majority of the program, and Comcast also provided additional funding to support the purchase of laptops. Researchers from the University of Washington (UW) Information School received a COVID-19 economic recovery research grant from the UW Population Health Initiative to support the qualitative research. SJI and the City of Seattle are not independent evaluators but helped create Digital Bridge, and SJI implemented the project. UW researchers did not assist in program implementation but did participate in ongoing meetings and gave feedback on project design. As of the writing of this paper, SJI and the City of Seattle plan to continue the Digital Bridge project with changes partly based on the findings detailed in this paper.

Due to the interlocking implementation and data collection roles, our positions and backgrounds likely influenced some of the collected data. During qualitative data collection, UW researchers tried to make clear to study participants that they were independent researchers and that all conversations were confidential. However, some participants still incorrectly inferred that we

helped run the program and this may have influenced what participants were willing to share with us. For the case managers qualitative data collection, the potential pool was much smaller and more likely that their identities would be inferred even though their responses and participation was confidential. All names in this paper are pseudonyms.

Sample

A total of 197 people participated in the Digital Bridge Program. All participants received a refurbished laptop, and 174 also received a mobile hotspot. SJI worked with four CBO partners to recruit participants to Digital Bridge in addition to SJI's recruited participants'. Program eligibility requirements include participants' household income be 200% or less of the Federal Poverty Line (FPL) based on the last three months of income. The average participant was 37 years old (S.D- 12.6; Range 18 – 64), Black or African American (73%), not Hispanic/Latino (79%), female (61%), makes 50% or less of the FFML, and lives in a household with a total of 3 people. Of the 146 that responded to the question about their current housing, 51% rent a house/apartment and 34% were homeless (vehicle, street, tent/RV, transitional, emergency shelter, or couch surfing).

We had 128 participants' citizenships status recorded, and of that number, at least 54% (n=69) were refugees, asylees, or immigrants. One CBO worked almost exclusively with immigrants and refugees and SJI recruited several participants through a relationship with another CBO that serves a specific immigrant and refugee community. Although we do not have specific numbers, some participants did not speak English as their primary language and had varying levels of English language fluency.

Technology access, skills, and comfort

Most participants had a device prior to enrolling with program: 78% had a smartphone (for 69%, this was their only device), 25% had laptop/desktop/tablet, and 7% had no device. The number of devices ranged from 0-3 with an average of 1 device per participant. Nearly half of participants (42%) stated they had no access to the internet at all upon program enrollment. Before joining the program, the most common way participants accessed the internet was through a Monthly Data Plan (21%), which was likely primarily used through a cell/smart phone device. However, 17% participants reported having home, wired internet. The average number of internet access points available (includes home internet, mobile hotspot, monthly data plan, pay-as-you-go data, and free Wi-Fi) was less than 1 per participant (.58, SD = .62) with a range of 0-2.

Digital Skills

Participants were asked to complete three Northstar Digital Literacy Assessments: Basic Computer Skills, Internet Basics, and Using Email; assessment scores had large ranges, but most participants that took the assessments did not pass. See Table 4 for a breakdown of tests and scores. Northstar classifies a passing score as 85% (*Assessment Info | Northstar Digital Literacy*, n.d.). Case managers determined that 29 participants did not have digital skills and/or English Language ability to successfully take the online Northstar assessment and conducted a paper-based screener instead (not shown).

Table 3: Northstar Digital Literacy Assessment Scores

Test	Example skills covered (<i>Northstar Digital Literacy V2.0</i> , n.d.)	Percent passed	Average Score	SD	Range
Basic Computer Skills; n = 49	Identifying computer hardware parts, drag and drop, locating camera, how to use the trash function	34.7%	78.8	11.0	48.0 – 98.1
Internet Basics; n=33	Identify browsers, fill out an online form, basic web safety, using internet search	21.2%	69.4	16.9	36.8 -95.6
Using Email; n=28	Log into and log out email, reply to email, open and download attachments, using email etiquette	39.3%	80.1	13.2	35.1 – 97.4

For a participant’s Northstar score test to get registered with SJI, they had to use the link provided in an email from SJI and create an account. Based on conversations with participants, we believe that some participants took the assessments, but their scores did not get registered with SJI. English language ability may have also interfered with participants to successfully complete the assessments.

Job training and employment

All Digital Bridge program participants received case management support for education or employment searching. Additionally, a sub-set (n=107) enrolled in formal, online training courses. The length of these differed depending upon the course. Individuals enrolled in a training course due to a combination of interest, availability, which CBO they worked with, and existing skills. 50 of these participants were enrolled in a digital skills course through a CBO partner, and the others received industry-related training such as in healthcare or manufacturing. Those not enrolled in this training program received case management assistance in the form of resume building and assistance enrolling in educational opportunities and job searching. The goal of job training and career navigation is moving individuals towards a career path with family-sustaining wages, but the initial outcomes are typically entry-level positions to prepare for more training and education.

Out of the 143 participants that SJI received data on, as of June 2021, 25 were placed in new, full-time positions and one in a new part-time position. The overall average hourly wage was \$18.39. Position titles include but not limited to career path titles like Assembly Production, Patient Sitter, Medical Assistant, and Welder and interim job titles like Food Processor, Retail Associate, and Security Officer This data does not include temporary positions that some participants had prior to enrolling in Digital Bridge.

Analysis

The majority of Digital Bridge participants needed structured support to use technology to complete online training and look for employment. Case managers also needed more support; they became participants' default help desk without sufficient training. Case managers found that they needed more time allocated in their workloads to sufficiently support participants and need digital skills training to properly assist users.

Sources of technology support

Digital Bridge participants received assistance using their technology from a variety of sources (including learning on their own), and it is sometimes hard to separate support offered by the program and personal connections. However, receiving the laptop and internet connection was an important first step. As one East African immigrant, Gabriel, described, you cannot learn if you do not have basic access to the internet and a computer:

It was difficult for me to learn because I do not have the internet, like I'm offline. Then I now have the computer, you know. I know I can learn how like, to check something on the internet. Like, how to read, check the information for your country, Africa, something at home.- Gabriel, interview

Gabriel had no access to the internet before receiving the technology from Digital Bridge. Even for participants that had access to the internet from their smartphone data plan, since almost everything had to be done online due to the pandemic, they had to learn new processes and skills. Sometimes participants' learning was driven by their own tasks and needs. Several participants also described having to learn how to do tasks on behalf of others such as remote K-12 schooling. When participants could not figure out how to do something on their own, they turned to their support network.

In the interviews, almost every participant described family, friends, and other community members giving them assistance using the computer and internet. Justine described a rich network of sources of assistance that she can rely upon:

If I need help using my computer, I can ask my children, my husband or my friends. Because my children will know. -Justine, interview

Like Justine, interviewees typically mentioned family first as their source for help. Sometimes these were family members that live at home but sometimes participants described calling someone or traveling to someone's home for help. Children, both adult and school-aged, were also a very common source for help. For school aged children, participants often described this help as a two-way street; children would help their parents sometimes, but other times parents would help their children. Parents of adult children enjoyed getting help from their kids and liked it as an excuse to see or talk to them.

Friends and other community members were also a big support for some participants. Several interviewees were active in their faith community and would get help from other members of their congregation. The East African immigrant interviewees also described getting assistance

from the ethnic community center. But not everyone had a robust support network. For some, the pandemic closed off their typical resources at the library or a nonprofit's computer lab. The interviewees that used these resources in the past talked about how beneficial it was to have someone physically nearby to answer questions. A few participants also described how moving or leaving a job cut off them from their previous support networks. The pandemic severed or greatly reduced many support ecosystems.

When asked during the interviews where they received help, some participants were less likely to mention case managers, but did mention it in voicemails. When prompted in the interviews, these participants did recall assistance from case managers. Since the voicemails were done daily, the case manager interaction may have happened more recently and thus participants were more likely to remember getting help. For example, participant Jasmine said in the interview that she only received technology help from her family, specifically, her son who she called her "IT Man," but in her audio diaries, she described getting help from her case manager on multiple occasions on creating her resume and redeeming a clothing voucher. It seems that since this assistance was so integrated into existing services that participants often forgot that it happened until prompted.

As a contrast, in their audio diaries and focus group, case managers described spending a significant amount of their time helping participants during job training classes, typical case manager-client interactions, or in direct phone calls and text messages. Marie, a case manager that shares a similar immigrant background as some of the Digital Bridge participants, spent a particularly large amount of her time on technology issues:

I have to spend like four hours and half just to help my participants set their laptop and set [up] Zoom... Everyone is coming at the same time, which is not easy for me to handle, but I try to do the best one at a time. – Marie, voicemail

In the interviews, many immigrant participants specifically mentioned Marie as a resource of technology assistance. In the focus group, case managers discussed that for some of the immigrant and refugee participants, a lack of English language fluency compounded the lack of digital skills to make technology use particularly challenging. These participants required more one-on-one time to gain comfort using technology. Although most interviewees did recall getting help from their case managers, the amount of help received differed greatly between participants.

The amount of assistance received from case managers and other support systems stood in stark contrast from how little participants used the technical support line. The support line was underused for three primary reasons: lack of integration into programming, nature of participant technology issues, and refurbisher capacity. First, many participants simply did not know the support line existed. The number was given out in orientation materials along with a lot of other information about the program. It was just too much information all at one time for participants, many of whom were experiencing one or more crisis in addition to the pandemic and have extremely busy lives – caregiving, working, attending training, seeking and accessing services, and looking for jobs. Second, due to being new device owners with lower levels of digital literacy, participants had a hard time differentiating between technical issues with the computer

or hotspot and lack of familiarity. When technical issues arose, they often needed immediate help (getting online for a training or a job interview), and case managers and family members were the easiest to access. Third, the refurbisher organization's staff suffered increased demand and additional constraints because of the pandemic. For participants that did call, some were met with long wait times.

Need for structured technology support and digital skills building

Digital Bridge was designed so that participants were expected to reach out and get help if they needed it from the technical support line. However, participants needed more structured, active technology support and guidance. Program managers discovered that the original structure left problems unresolved and there was particular a need for greater hands-on support when users initially received and began using the equipment. Due to the pandemic, participants picked up their computers from a distribution point and then were supposed to set up their devices on their own and reach out for help, but that did not work for some program participants:

[At first], I didn't know the password [for the Wi-Fi hotspot]. I didn't use [it] ...because I didn't find the password. But after, I think, one month, one day [my case manager] called me...I said, I didn't know the password. She told me, "Just open the cover and you will see the password." Then when I opened that I saw the password. It's very easy, just know the name of your [hotspot] and the password. – Solange, interview

Solange's problem only got resolved after a case manager reached out to confirm that Solange's laptop and hotspot were working. Even some people who did figure out how to set up their computer on their own wished that someone could have provided in-person step-by-step guidance and answered questions. As noted above, participants are busy and have very limited capacity to troubleshoot their technology problems. In the focus group, case managers emphasized that everything should be as simple as possible. Participants would have benefited from step-by-step instructions, receive walk-throughs, and review new skills multiple times. Case managers felt stretched thin by their current caseloads. Providing this additional assistance and support materials would have required more resources than available in this initial project.

Relatedly, the technology support services were highly reliant on self-learning and discovery. Though the computers came with desktop shortcuts to bookmarked resources online, most participants did not use them because they did not want to "mess it up." In addition, case managers felt like all the desktop icons cluttered the screen and made it more overwhelming for participants – especially those with lower levels of English language ability. Most of the interviewees said they wanted structured digital literacy assistance to get more comfortable with their devices:

It will be not easy if I learn by my own. Other than that, if a friend can teach me, or if there is any class I would love to join that, because that would be easy for me to learn. – Zahra

In her interview, Zahra described a variety of online activities she could do on her laptop and smartphone (finding children's craft activities, looking for jobs and daycares, using telehealth services), but she at the same time, she struggled with basic computer skills such as using bookmarks or retrieving closed browser windows. In the interviews, participants talked about wanting to become "more efficient" with their laptops and phones and felt that more help or a digital class could help them achieve their goals as opposed to doing it on their own.

In addition to the participants, case managers wanted more training covering general digital skills, technology distributed to participants, and basic technical support. Case managers needed guidance on how to help participants work through common technical stumbling blocks and then when to refer them to someone else with more technical expertise. Case managers should not be expected to become IT help desks. However, technology issues often pop up during scheduled case management sessions and during online job training. Case managers needed tools to help participants troubleshoot common issues and with basic technology concepts. For example, in this interview, participant Jasmine describes a miscommunication with her case manager around taking a screenshot:

*I had got a voucher for some clothing. And so my case worker was like, "Pick your clothing on Amazon and then send it to me, your total." And so, I was like, "What?" So, I sent him something, but...what he wanted me to do is take a screenshot on the computer, and then go back in and send it. And that's where I had my biggest problem...My case manager did not understand that I did not know what he was talking about. We had a total miscommunication and I ended up getting angry with him. I ended up talking to his boss...So he walked me through on the computer. I guess he was like my technical support. –
Jasmine, interview*

Jasmine's case manager could have benefited from knowing how to identify gaps in Jasmine's familiarity with digital tools and how to give basic how-to steps over the phone. In addition, basic troubleshooting support knowledge can help case managers determine more quickly if it is an easy fix they can help with or something beyond their capacity and helps them make a better handoff to more comprehensive support (e.g., tell the participant what to ask help for). More training and support for case managers can set themselves and their clients for success.

Providing technology assistance on top of the program-specific paperwork (documentation to establish and maintain federal benefit programs, required surveys, and digital skills assessments) all created a great deal of stress and additional time burdens for case managers. CBOs had to learn best way to communicate with participants who were experiencing multiple crises without in-person assistance. For example, SJI discovered that emailing was not an effective communication tool for beginning users. Participants often did not respond to email with requests to complete information. Text messages were more likely to get a response and helped bridge the communication gap created by not being able to meet face-to-face. Initial in-person sessions to receive and get oriented to equipment, even if provided in a masked and safe-distance environment, and reducing paperwork could have helped overcome some initial challenges.

Participant technology needs

Choosing technology to distribute is complex and needs to consider individual needs and the organization's own resources. For many of SJI's participants, the refurbished laptops and hotspots met their needs. However, a subset did have recurring issues with the laptops and hotspots which interfered with their experience in Digital Bridge and prevented them from completing basic tasks.

Hotspots

SJI purchased the mobile hotspots through a refurbisher but are supplied and managed by Mobile Citizen which operate on the T-Mobile network. The hotspots cost \$75 and with a monthly fee of \$10/month; maximum download speeds range from 25 Mbps (4G LTE) – 100 Mbps (LTE Plus) (*Mobile Citizen - Social Equity Through Access, n.d.*) and has broad coverage in the Seattle area. The mobility and flexibility of the hotspots was an added benefit for some participants:

Today I used my [hotspot] to file my unemployment. I was out of town, really, and luckily, I had my [hotspot] with me which gave me internet access and I was able to file for my unemployment. And I really can't think of nothing that could've help me more. I'm really grateful. The [hotspot], the free internet, is really... Thank you. – Jasmine, voicemail

Like Jasmine, several participants mentioned the mobility of the hotspot helped them connect to the internet outside their home – particularly those experiencing homelessness and housing insecurity. In her interview, Jasmine described how she keeps her hotspot in a fanny pack so that her smartphone has connectivity wherever she goes. Others worried about losing their hotspots and did not take them outside their home. Several interviewees also mentioned connecting their hotspots with other devices such as their televisions. Unfortunately, several interviewees did not know they could connect other devices to their hotspot and thought it could only be used with their laptop. Reviewing all the capabilities of hotspots could be carried in future technology orientations.

Originally, the program intended to offer participants the option of having a wired cable broadband subscription, but as the program began, SJI case managers quickly discarded this option. Participants overwhelmingly preferred the hotspots, and for case managers, enrolling participants in the cable broadband internet service provider's (ISP) low-income internet offer was too complex and burdensome on top of their other job duties. Setting up the initial sponsorship agreement took time and that contributed to a focus on the hotspot option. To enroll someone in the cable broadband internet service, case managers needed to schedule a phone call with the participant and with the ISP and assist the participant through the sign-up process. SJI could not directly enroll the person because they cannot have shared personally identifiable information with a third party without a signed release of information. This was very difficult to obtain while social distancing when participants did not have internet access or familiarity with tools like AdobeSign. Logistically, it was just easier to deploy the hotspots. Case managers could easily add the hotspot to the participant's order through the refurbisher, and participants and case managers did not have to go through an additional enrollment and installation scheduling process.

Additionally, the hotspot affordances better suited many Digital Bridge participants. First of all, at the time of the program, the low-income offers from the cable broadband ISPs serving Seattle had slower maximum download speeds (25 Mbps) than compared to the hotspots (Strong, 2020). Second and more importantly, many Digital Bridge participants are insecurely housed if not technically unhoused. They move frequently and a wired internet subscription would require them to navigate the ISP's systems to disconnect and reconnect service at their new address, assuming it was in the ISP's service area, to receive the full 12 months of service. Each additional task – identifying ISP providers, using customer support, and moving internet services – creates additional burdens for someone surviving housing insecurity.

However, hotspots did not work for all participants. Some participants did not have a good connection at their home and did not have download and upload speeds sufficient to reliably connect to Zoom. This caused major disruptions to their ability to participate in online training. As a result, case managers and instructors spent time during and after class trying to troubleshoot connections and catching helping participants on material they missed. It was unclear why some participants did not get clear signals on their devices; they could live in geographic dead zones or buildings where the building's architecture interferes with the signal (Student Home Internet Connectivity Study, 2021). Participants that struggled with their hotspots would use their phone's data plan or go to someone else's home for connectivity.

Refurbished laptops

For many of the participants, the refurbished laptops worked well, but two main recurring problems emerged: battery life and device fit. Due to living situations, battery life was important; participants might not always have access to electricity or an outlet. Overall, refurbished computers have shorter battery lives than newer laptop models (Dove, 2017), but a subset of laptops received by SJI had very short battery life (30 minutes – 1 hour). SJI then had to coordinate with the participant to return the laptop to the refurbisher. Although the laptops came with a 12-month warranty, the battery's warranty lasted only 30 days. Trying to coordinate these returns with participants in such a short time frame put another stressor on SJI case managers and staff. These returns also interfered with participants' job training and prevented them from completing other tasks. And while many participants sought help from their case managers when they encountered these problems, some just gave up on using the device, which case managers found out by happenstance.

Finding the correct device fit, the complexity of the computer operating system and software to the participants' need and capabilities, proved more challenging than expected. All participants received PCs installed with Windows 10 and Microsoft Office Suite. Case managers felt like participants, especially those with lower English language ability were overwhelmed with all the software and menus that PCs have. They felt that these participants and others with less familiarity with laptops would benefit more from more simple devices without so much software such as Chromebooks. When helping clients, it was often difficult for case managers to pull apart what issues were related to an individual's technical know-how and what was an issue with the technology itself. This came up in the interviews as well. For example, one participant described

recurring issues of the screen “getting very large;” she believed it was a problem with the computer itself, but she could have been accidentally enlarging it with the trackpad. The pandemic again made these challenges even more difficult without in-person access to technology help.

Conclusion

Technology distribution and skill building will need to work within broader social and economic assistance programs to unlock living wage careers. Success in enabling access to and use of digital tools for un- and under-employed workers requires a set of system supports and program integration with the employment assistance services. Digital Bridge targeted job seekers to provide essential digital tools, but did not expect through this program that these job seekers would get a job solely due to having technology. Although access to digital technologies is needed to look for jobs, it does not equal employment. Even with training and case manager support, only 26 participants had found employment as of June 30, 2021. For example, many participants had young children at home; without safe, sufficient in-person schooling and childcare, caregivers cannot return to the workforce. Based our experiences, we lay out our learnings around program design and the policy needed to support programs like Digital Bridge.

Design

Participants emphasized the positive impacts that receiving technology had on their lives which allowed them greater access to online training, job search activities, and other critical tasks. This did not happen from device and internet connection alone but because of each participant’s “ecology of support” (Gangadharan & Byrum, 2012). SJI’s experience corroborates with previous literature: participants depend upon digital technology ecosystems to receive technology help from people and organizations that they trust – even after receiving personal technology.

Digital Bridge participants used their own personal and community resources (e.g., religious and ethnic communities) to support their initial technology use but also wanted more structured support from SJI. In response to early learnings from the program, SJI created a new role to manage Digital Bridge logistics and proactively help with technology issues. This program manager tracks technology inventory, reaches out after someone receives their technology to ensure participants have a working laptop and internet connection, answer initial questions, act as the main point of contact for technology troubleshooting with the participant, and act as a liaison with the refurbisher. The program manager develops a relationship with each participant early in the program to help build comfort and trust when other technology issues arise.

Even with a specialized role leading technology assistance, case managers still will field technology questions and need to troubleshoot with participants on an ad hoc basis. Many of the technology problems came up during online training or a case management session. Larger, reoccurring issues can be referred to someone else, but often troubleshooting needs to happen immediately, so a participant’s need can be met. SJI wants to offer training for digital skills and basic technology troubleshooting for case managers at SJI and partner CBOs. The training would help case managers complete their own daily tasks, support participants’ technical issues, and develop a familiarity with participants’ technology.

The technology that participants receive also need to be tailored for individual needs. More recently, SJI started distributing mostly Chromebooks to participants instead of refurbished laptops. SJI found the simplicity, battery life, and warranty on the new computers much easier to manage and a better fit for participant needs. However, participants that enroll in IT related job training need a PC, and in those cases, SJI gives a PC. As for internet service, hotspots appear to fit many participants needs – especially due to the high levels of housing insecurity. However, SJI wants to have more flexibility in providing alternative internet access if participants get poor connectivity at home. However, this flexibility increases the administrative and organizational complexity and burden.

Policy

Federal funding for digital inclusion programs has increased since the start of the pandemic, and policy and funding from the public and private sector will shape access to resources necessary for Digital Bridge and similar programs to be implemented. Unfortunately, some of the federal workforce funding that SJI typically uses to support client needs only supports laptop lending programs – not ownership programs like Digital Bridge (Shahin, 2020, pp. 4–5). A lending program would take even more organizational resources to manage and maintain devices and would leave program participants without critical digital technologies (again) upon exit from the program. Increasing the organizational capacity to successfully provide support costs more than the technology and usually has less available funding. To continue the program, SJI needs funding for inventory management, digital skills training for staff, basic technology support training for staff, and instructor-led digital skills training for participants.

Funding should also allow the purchase of technologies that best fit people’s needs. Although participants preferred hotspots due to the flexibility and mobility, some could not use the hotspots due to dead zones at their home. However, low-cost wireline programs and enrollment need to be simplified and provide affordable and sufficient bandwidth for a family’s needs. Low-barrier sign-up for low-income broadband programs would increase the uptake for participants and assist case managers and others assisting participants in reaching more job-seekers.

Lastly, for policy and funding to build off best practices, more digital inclusion research funding is also needed to better understand successes and challenges of digital inclusion and Digital Navigator programs. Longer-term investigations could better reveal organization and participant needs and solutions. Examples include longitudinal studies of recipients of devices and internet connectivity, investigation of community-wide support networks (include public libraries, CBOs, and community organizations), lowest barrier options for internet delivery, program delivery costs, successful support frameworks for English language learners, and more focus on digital skills development. The Digital Bridge project demonstrates the impact that starting technology supports can have and how critical it is to resource and provide a wholistic system of support for job-seekers' technology access, digital skills development and support needs. Insufficient investment risks increasing digital inequity and barriers to economic opportunity.

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