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# Developing a Digital Equity Theory of Change with Tech Goes Home

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Digital Equity  
Research Center



METROPOLITAN  
NEW YORK  
LIBRARY COUNCIL



TGH Tech Goes Home

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# Developing a Digital Equity Theory of Change with Tech Goes Home

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## Executive Summary

This report presents findings from a participatory action research project led by the Digital Equity Research Center at the Metropolitan New York Library Council and Tech Goes Home located in Boston, Massachusetts. The purpose of the project was to understand how participatory action research could be used to develop a theory of change and an evaluation framework to benefit Tech Goes Home, its community, and the larger digital equity field. To inform the project, the research sought insights from digital inclusion and digital equity organizations across the United States to understand how they articulated what success looks like to them and their communities. The research team examined how these theories of change help organizations use data to evaluate their programs and services. The ultimate goal of the project was to gather data to assist Tech Goes Home in developing a theory of change for the organization that could inform how the organization measures the outcomes and impacts of their digital equity work.

Researchers at the Digital Equity Research Center worked closely with staff at Tech Goes Home, utilizing participatory action research methods throughout the entire project. This paper presents findings from the analysis of qualitative data, including interviews and focus groups. A total of 43 people participated in the participatory research project. Participants included representatives of the following populations: (1) learners in Tech Goes Home programs; (2) instructors who teach Tech Goes Home courses at their community-partner organizations; (3) Tech Goes Home staff, managers, and directors; and (4) a small group of representatives from peer digital inclusion and digital equity organizations from across the U.S. who shared their experiences and insights.

Based on the analysis of data collected through these multiple perspectives the following key findings emerged through the study.

## Key Findings

- **Benefits for learners in TGH programs were best understood as short-, mid-, and long-term outcomes that translated well into the logic model.** Not only did focus group participants share their success with skills like using word processing software to create their resumes (i.e., short-term outcomes), they also talked about social outcomes for themselves and their family members, such as gaining the confidence to produce digital media and to impact others in their community. Interviews with TGH instructors helped to verify many of the outcomes described by learners during our focus group sessions, which translated well into the final version of the logic model that was created as part of this project.
- **TGH programs have ancillary benefits for community partners.** While the focus

of this study was to learn about the outcomes and impacts of TGH programs on learners who complete the programs, our research team also discovered additional benefits for instructors who teach TGH courses at community-based partner organizations and, by extension, the organizations themselves.

### **Additional Insights from Peer Digital Inclusion and Digital Equity Organizations**

- **Measuring broader outcomes is challenging.** One of the resounding messages that resulted from this project was that it is difficult for community-based organizations to measure the broader social and economic outcomes of their digital inclusion programs. Measuring outcomes is challenging because of the complexities of proving causality, e.g. an individual who takes a digital literacy class experiences positive social, economic, educational, and health outcomes as a direct result of having taken the class.
- **Program evaluation software is expensive.** The second takeaway from our interviews with peer organizations is that not only is outcomes-based evaluation challenging, the software required to collect data and show outcomes is expensive. This is because the software requires customization from IT professionals to adapt the technology to meet the needs of digital inclusion and digital equity organizations.
- **Evaluating programs with community partners requires additional work.** Tech Goes Home is not the only digital equity program in the country that relies on other community-based organizations for their service delivery. This model of service delivery raised several questions related to how organizations like TGH are able to measure the outcomes and impacts of their programs not only for the individuals who benefit from services, but also for the community-based organizations with whom they partner.

## Recommendations

### **For Tech Goes Home**

- **Gather data on outcomes for community partner organizations.** Based on conversations with TGH staff and instructors at partner organizations, we were able to see that TGH programs had positive impacts on the staff and work of community partners. However, we were unable to incorporate this into the larger theory of change because of limited data. As our research team initially set out to examine the outcomes for learners, our data collection was not focused on the outcomes of these partners. TGH staff has since recognized this as a site for expansion, such as through surveys of partner organizations.

- **Collect data on advocacy outcomes.** Members of the advocacy team at TGH were key partners in this participatory action research project. While the advocacy team at TGH has identified that addressing the digital divide requires tackling structural inequality and systemic injustice, such as racism and poverty, future evaluation efforts at TGH should include gathering data to show the outcomes and impacts of the advocacy team's activities.
- **Continue engaging researchers to measure community-level impacts.** TGH understands that the impacts of their programs are likely felt not only by direct participants, but by those participants' families, neighbors, and communities. However, TGH data collection does not include community-wide indicators and their relation to long-term digital equity goals. Continuing to engage the expertise and outside perspective of researchers can help to identify those indicators.

### For Digital Equity Organizations

- **Allocate time, money, and intentional effort to capture insights and expertise from community members.** Recent discussions in the digital equity field, both at practitioner conferences and in other spaces where digital equity researchers are gathering, have argued that organizations must pay community members to gain their expertise and participation in program evaluations.
- **Engage evaluation participants in their native languages.** Digital equity organizations that serve learners who speak multiple languages should work to ensure that their needs are considered in program evaluation efforts. These populations are likely to face compounded barriers to both digital inclusion and survey participation, and their experiences are therefore crucial to accurately understand the impact of programs.
- **Work with funders to balance reporting requirements with sensitivity to participants' privacy and attention to self-defined measures of success.** Other digital equity organizations identified that one of the significant challenges they face is the need to gather data to show funders the outcomes and impacts of their financial support, while also showing community members why these activities are mutually beneficial. There can also be challenges in marrying what a funder requests and what the organization knows is perhaps a more representative indicator of success. Organizations should work with funders to establish respectful guidelines that ensure program evaluation is compelling, representative, and responsive to community needs.

### Advice from Peer Organizations

- **Digital equity organizations should stay focused on what they do well.** Because the priority of funders can change over time, thus making program evaluation a moving target, we heard from our interviewees that it's important for organizations

in the digital equity field to stay true to their mission and the communities they serve.

- **Provide support to community partners when they are asked to gather sensitive information.** Digital equity organizations—like Tech Goes Home and others who we interviewed for this project who work with community partners to provide their programs and services—should co-create meaningful and respectful ways to address privacy concerns mentioned above. One way to do this is to take the lead on gathering this information and avoid placing the burden on community partners.
- **Listen to your community, ask them for advice.** Most of the people from peer organizations who we interviewed for this study relied on the knowledge, expertise, and wisdom of their community members and partners. Particularly in helping to define what success of their digital equity programs look like. Therefore, it's essential that digital equity organizations develop deep ties and connections with people and leaders in their communities to ensure that digital equity programs address their needs and inform further opportunities to work towards digital equity and social justice.

### For State and Federal Policymakers

- **The success of broadband infrastructure programs relies on digital equity funding.** Community members cannot access the digital world without affordable and reliable internet service, internet-equipped hardware, and hands-on support in making use of it. When evaluating the success of broadband deployment, administering entities must also consider whether communities have access to the digital equity programs necessary to make use of broadband access.
- **Set aside funding that organizations can use to conduct program evaluation.** Digital equity organizations have been arguing for years that if funders expect them to show the outcomes and impacts of their investments, the organizations should be compensated to do this work. Because program evaluation is time-intensive particularly when engaging covered populations, state and federal entities should allocate funding that can be used by digital equity organizations to measure the success of their state or federally funded programs as part of contracts.
- **Provide technical assistance on program evaluation for digital equity organizations.** In addition to funding, state and federal entities should provide technical assistance to support digital equity organizations in conducting outcomes-based evaluation. Counting outputs, such as numbers of digital skills classes offered or numbers of computers distributed, is a much easier task for organizations. However, if digital equity organizations are required to show the mid and longer-term outcomes, as detailed in the Tech Goes Home logic model in this report, then technical assistance must be provided by state and federal entities to help local organizations, particularly under-funded nonprofits, with this work.

- **Allow and encourage organizations to use government funding to compensate community members for their expertise.** State and federal agencies should require grantees that receive funding to implement and evaluate digital equity programs to provide evidence that community members were engaged in determining what the success of these programs look like. State and federal agencies should also ensure that compensating community members for their expertise be allowable as a budgetable expense. If this unprecedented federal funding is truly to make an impact, then those most impacted by digital inequalities must be included as partners in the creation, implementation, and evaluation of these programs.

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## Introduction

The National Digital Inclusion Alliance has defined digital equity as a condition in which “all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy.”<sup>1</sup> While there are many efforts in progress to address the digital divide, this goal remains largely aspirational. Digital inequity continues to be a significant problem in most U.S. states, including Massachusetts. 453,893 people in the state (16.45%) lack a desktop or laptop computer<sup>2</sup>, and 95% of these individuals live in urban areas.<sup>3</sup> 495,057 people in the state (17.94%) lack “broadband,” or high-speed internet connection (i.e., fiber, cable, or DSL), and 93% of these individuals live in urban areas.

Historically underserved populations, including communities of color, immigrants, low-income communities, and older adults face compounded barriers to digital inclusion and exhibit much higher rates of disconnection. For example, while 32% of Massachusetts households with incomes below \$20,000 per year do not have home broadband, just 3% of households earning \$75,000+/year remain disconnected.<sup>4</sup>

Both the digital divide and government efforts to address it have been present for decades in Massachusetts. The Tech Goes Home program originated more than 20 years ago, in 2000. After the program’s initial success in a school setting, the City of Boston applied for a federal grant in 2010 to expand TGH using the model on a citywide basis. Community organizations and institutions such as public school systems and libraries have provided tech support and computer classes since the early 2000s, and municipalities such as the City of Boston have provided financial support for such programs across the Commonwealth.

In the past five to ten years, many local governments in Massachusetts have recognized the importance of internet infrastructure. At least twelve municipalities in the state have

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1 <https://www.digitalinclusion.org/definitions/>

2 <https://data.census.gov/table?t=Telephone,+Computer,+and+Internet+Access>

3 [https://data.census.gov/table/ACSST1Y2021.S2801?q=internet+access+by+city+massachusetts&q=040XX43US25\\_040XX01US25\\_040XX00US25](https://data.census.gov/table/ACSST1Y2021.S2801?q=internet+access+by+city+massachusetts&q=040XX43US25_040XX01US25_040XX00US25)

4 American Community Survey data, 2016-2021.



solicited public opinion on, issued study orders, and conducted financial estimates for publicly-owned broadband infrastructure and open access networks. Beginning in 2016, the Commonwealth, the Massachusetts Broadband Institute (MBI), and the Executive Office of Housing & Economic Development (EOHED) have invested and overseen residential broadband access projects in 53 “Last Mile” Towns, or towns completely or partially unserved by cable broadband service. Of these 53 Towns, 48 completed projects and an additional 5 municipalities have some premises connected but are not fully complete.<sup>5</sup>

The COVID-19 pandemic directed national attention to the urgent challenges posed to communities affected by the digital divide. It also demonstrated that the existence of internet infrastructure does not in and of itself indicate digital inclusion. Government agencies have increasingly stressed what some dub the “three As”: access, adoption, and affordability. Without internet-enabled devices, affordable high-speed internet service options, and hands-on support and training to utilize those resources, millions were (and still remain) disconnected from essential services. These are among the reasons why significant dollars within both the American Rescue Plan Act of 2021 (ARPA) and the Infrastructure Investment and Jobs Act of 2021 (IIJA) were set aside for digital equity initiatives. These federal funds have been funneled through administering entities including municipalities like the City of Boston and agencies like MBI. They also accompany directives to engage in resource mapping and digital equity planning projects.

The Digital Equity Act, contained within the IIJA, allocated \$2.75 billion to fund projects across the U.S. that promote “meaningful adoption and use of high-speed Internet service” particularly for covered populations. The Digital Equity Act defines covered populations as members who identify themselves as being part of one of more of the following groups:

- **Low-income households**
- **Aging populations**
- **Incarcerated individuals**
- **Veterans**
- **People with disabilities**
- **People with language barriers**
- **Racial and ethnic minorities**
- **Rural inhabitants<sup>6</sup>**

Administering entities have sought to identify organizations who have proven records of serving these populations and who are prepared to convert these funds into increased

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5 <https://broadband.masstech.org/last-mile-programs>

6 <https://www.internetforall.gov/program/state-digital-equity-planning-grant-program>

digital access across the Commonwealth. One such organization has been working to expand digital equity for covered populations for over 20 years: Tech Goes Home.

## Tech Goes Home

Tech Goes Home (TGH) is a nonprofit dedicated to advancing digital equity. Since it was established in 2000, Tech Goes Home has helped tens of thousands of people in Greater Boston and beyond gain access to the digital world. Working in partnership with more than 100 community partners in municipalities across Massachusetts, TGH provides access to digital devices, internet connectivity, and digital skills training. TGH's approach to advancing digital equity is grounded in what they deem the three "legs of the stool": skills, devices, and internet. Every TGH graduate who completes 15 hours of digital skills training through a community partner organization earns a new computer or tablet, and, if needed, a year of TGH-paid internet.

TGH uses a train-the-trainer model to offer culturally-responsive digital skills courses. Rather than keeping in-house instructors, TGH trains staff at partner organizations with established grassroots connections in order to deliver digital skills courses. Courses are designed to be accessible and responsive to the needs of learners who enroll; nearly 4 in 10 courses are taught bilingually or in a language other than English.

TGH deliberately partners with communities most affected by the structural injustices at the root of digital exclusion. Of all TGH learners, 93% live in households that are considered "very low income" (U.S. Department of Housing and Urban Development, 2023), 86% identify as BIPOC (including 39% who identify as Black and 30% who identify as Latinx), 60% speak a primary language other than English, and 35% of adult learners are unemployed. TGH partners are organizations—libraries, public schools, nonprofits, community health centers, senior centers, and more—who serve these populations, have a built trust among their communities, and whose work can be elevated by providing digital access.

In a recent survey conducted by Connect Humanity, nearly 80 percent of nonprofits surveyed said that a lack of internet access, tools, or skills among their staff or those they serve limits their work, while 90 percent considered the internet critical to their work. TGH addresses this gap by equipping staff at TGH partner organizations with the hardware, resources, and training needed to deliver digital skills courses and connect those they serve. In this way, TGH amplifies work that promotes broader outcomes for learners, such as education, employment, healthcare access, reduced recidivism, immigrant rights, and more. TGH programs help to get participants "in the door" of a partner site; after completing a TGH course, many learners return to the partner sites and engage more actively with their events, programs, and resources. TGH has also found that they have increased their partners' ability to provide programming remotely by integrating existing services with resources and opportunities available through digital access. These activities have also led to broader

outcomes for their community partner organizations and the wider digital equity ecosystem<sup>7</sup> in Greater Boston.

In April 2023, TGH was awarded a \$4.5 million grant from American Rescue Plan (ARPA) funding allocated for digital equity. The grant, awarded and distributed by the Massachusetts Broadband Institute (MBI), is the largest single grant in TGH's history. TGH's vision is to help Massachusetts become the first state in which all individuals have access to the digital tools, skills, and connectivity they need to thrive. To this end, TGH aims to use the funding to pilot a new subgrant program and expand TGH programming to 13 Gateway Cities<sup>8</sup> across Massachusetts.

As part of ongoing efforts to increase organizational capacity to meet these goals, TGH sought to better understand, evaluate, and represent their programs. It is within this context that they engaged in the research collaboration detailed in this paper. The hope was that the findings from this research project could also be used to help inform the broader digital equity field, as \$1.5 billion is being invested to advance digital equity across the U.S. through the Digital Equity Act.<sup>9</sup>

## Definitions

This section provides a list of terms that are used throughout the report and serve as some of the basic assumptions underlying the research and its findings.

- **Digital equity** - The National Digital Inclusion Alliance defines digital equity as the following: "Digital equity is a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services." On the same page on their website, the following description is included under the definition: "It is important to note here the use of 'equity' vs. 'equality.' When we use the word equity, we accurately acknowledge the systemic barriers that must be dismantled before achieving equality for all."<sup>10</sup>
- **Theory of change** - The Annie E. Casey Foundation defines a theory of change as "the beliefs and assumptions about how a desired change will happen or a goal will be realized. The term also can describe a specific product that expresses those beliefs and assumptions by depicting how strategies relate to expected outcomes

7 For a definition of "digital equity ecosystems," see <https://dercenter.org/digital-equity-ecosystems/>

8 The Massachusetts legislature defined 26 Gateway Cities, or midsize urban centers that anchor regional economies around the state (MassINC). For a full legal definition, see [here](#).

9 <https://internetforall.gov/program/digital-equity-act-programs>

10 <https://www.digitalinclusion.org/definitions>

and ultimate goals.”<sup>11</sup> The Center for Theory of Change explains that a theory of change is focused “on mapping out or ‘filling in’ what has been described as the ‘missing middle’ between what a program or change initiative does (its activities or interventions) and how these lead to desired goals being achieved.”<sup>12</sup>

- **Program logic model** - The W. K. Kellogg Foundation defined a program logic model in the following way: “a picture of how your organization does its work – the theory and assumptions underlying the program. A program logic model links outcomes (both short- and long-term) with program activities/processes and the theoretical assumptions/principles of the program.”<sup>13</sup>
- **Participatory action research (PAR)** - This research approach requires intentional collaboration between researchers, practitioners, and community members with a strong focus on using research for social change. In other words, “PAR is a collaborative, iterative, often open-ended and unpredictable endeavor, which prioritizes the expertise of those experiencing a social issue and uses systematic research methodologies to generate new insights. Relationships are central. PAR typically involves collaboration between a community with lived experience of a social issue and professional researchers, often based in universities, who contribute relevant knowledge, skills, resources and networks.”

<sup>14</sup>These definitions also provide additional context to understand how participatory action research was used to bridge the gap between digital equity research and practice for the project described in this paper.

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## Project Overview

In February 2023, Tech Goes Home (TGH) hired the Digital Equity Research Center (Center) to assist TGH in developing a theory of change and related insights. The purpose of this work was to help TGH prioritize, and more clearly articulate, the organization’s current program evaluation needs and future evaluation directions. The final deliverables for the project included: (1) a theory of change that could be used by TGH to assist the organization with program articulation and evaluation; and (2) this final report with findings from the project that could be shared more broadly with the digital equity community, including governmental stakeholders such as the City of Boston, the Massachusetts Broadband Initiative, and the National Telecommunications and Information Administration.

The project was divided into the following two phases of work led by the Center working

<sup>11</sup> <https://www.aecf.org/resources/theory-of-change>

<sup>12</sup> <https://www.aecf.org/resources/theory-of-change>

<sup>13</sup> [https://www.naccho.org/uploads/downloadable-resources/Programs/Public-Health-Infrastructure/KelloggLogicModelGuide\\_161122\\_162808.pdf](https://www.naccho.org/uploads/downloadable-resources/Programs/Public-Health-Infrastructure/KelloggLogicModelGuide_161122_162808.pdf)

<sup>14</sup> <https://www.nature.com/articles/s43586-023-00214-1>

closely and collaboratively with Tech Goes Home:

- **Phase I** - a digital equity landscape analysis to understand the program evaluation needs and challenges of the broader digital equity field, as well as an internal needs assessment at TGH focused on the organization's current program evaluation processes.
- **Phase II** - interviews and focus groups with TGH learners, instructors, and staff to inform the development of the theory of change.

## Building on Existing Data Collection

TGH has an existing evaluation infrastructure used to collect feedback from program participants. They administer pre- and post-course surveys to gather quantitative and qualitative data about their programs, and to capture learners' experiences directly following their course. TGH instituted an annual follow-up survey process in 2010 with the hopes that it would elucidate the longer-term impacts of programs on learners' lives.

TGH is aware that the population they intend to reach with surveys—participants in TGH programs—are likely to face elevated difficulties accessing and completing online surveys, even after graduating TGH courses. They invite graduates via email to complete the survey, follow up with outreach over text, and finally conduct phone-banking campaigns to reach their most disconnected participants. Phone outreach targets graduates whose first language is not English and is conducted bilingually in English and Spanish.

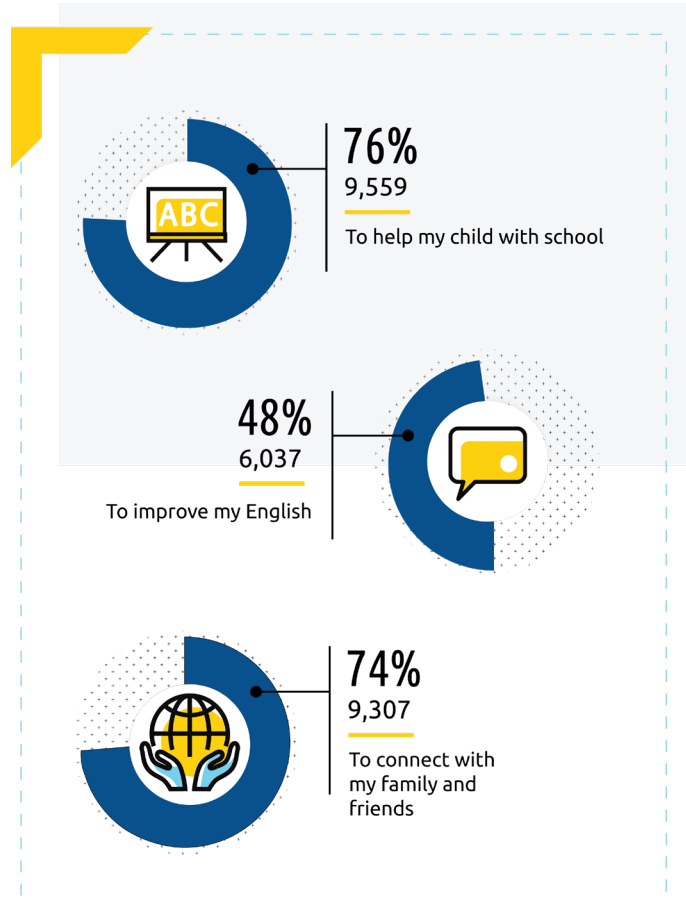
Spanish-speaking individuals represent 27% of all TGH graduates.

As a result, the TGH annual survey receives over 400 responses each year. The survey has illuminated impacts of digital equity programming across areas including health access, confidence, education, and employment. Their 2023 Impact Report includes key data indicating evidence of TGH's impact in these areas. In December 2022, immediately preceding their collaboration with the Research Center, TGH conducted a 5-year retrospective of their annual survey. The following diagrams summarize some of these findings.

Thus far, TGH has used survey findings to understand the motivations, goals, and experiences of people who take TGH courses. These findings are applied to reports, highlights them for funders, and utilizes them when engaging legislators. However, the reality of the digital divide and of TGH's partnership model means that—as seen in the above graphics—impacts are diffuse across populations, geographies, and issue areas. As both government grant dollars dedicated to digital equity and the urgency of addressing digital inequalities in various geographies increased, TGH desired a more comprehensive understanding of its services and outcomes. TGH sought to create a targeted model that a) was built using data

gathered directly from TGH learners, instructors, and community members, b) clarified the key components and impact areas of TGH programs, and c) clearly represented TGH’s mission, model, and ethos for external audiences. Subsequently, they embarked on a collaboration with the Center which is detailed in this paper. This practitioner-research collaboration analyzes, deepens, and aims to direct TGH’s future data collection.

**Figure 1. Why do learners take TGH courses?**



**Figure 2. How do adult learners use their device?**

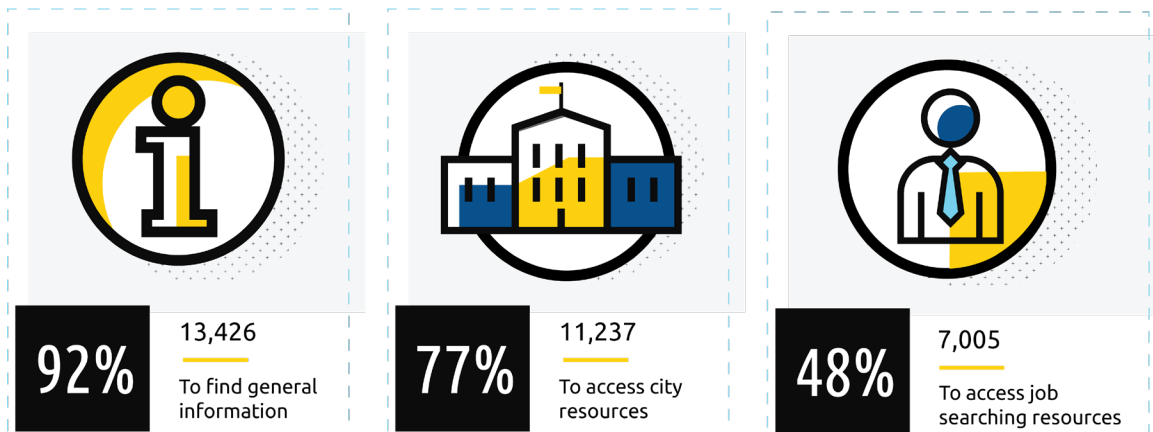


Figure 3. During COVID-19

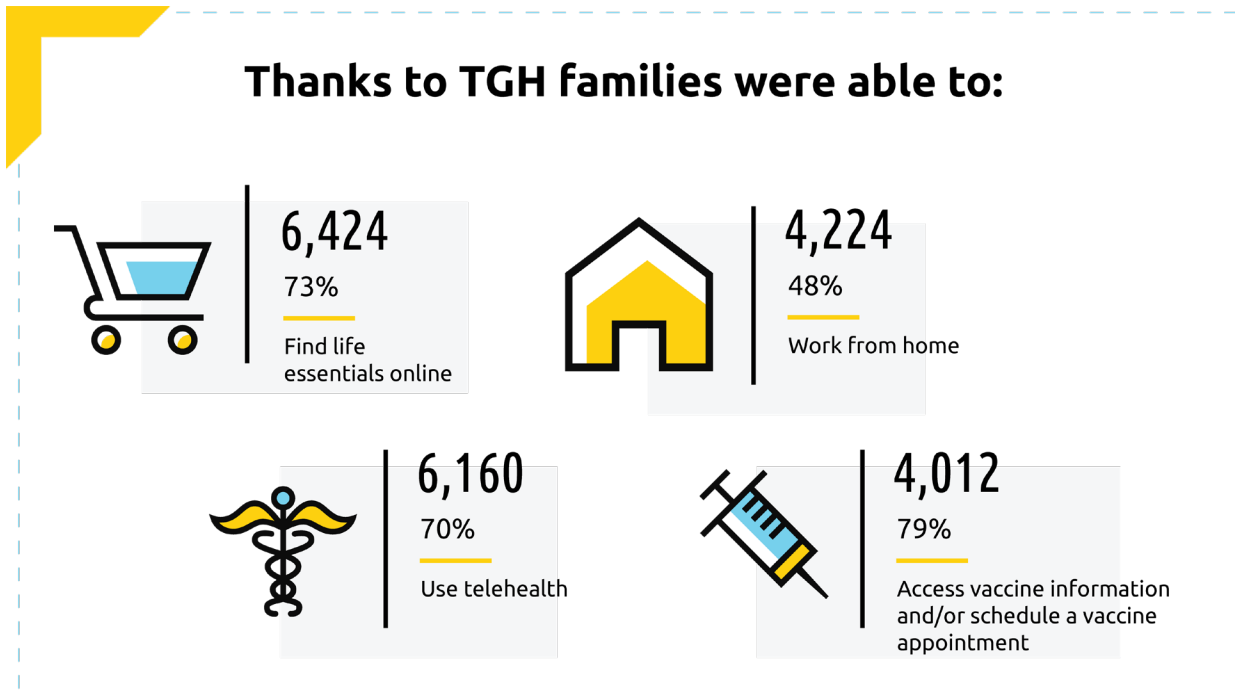


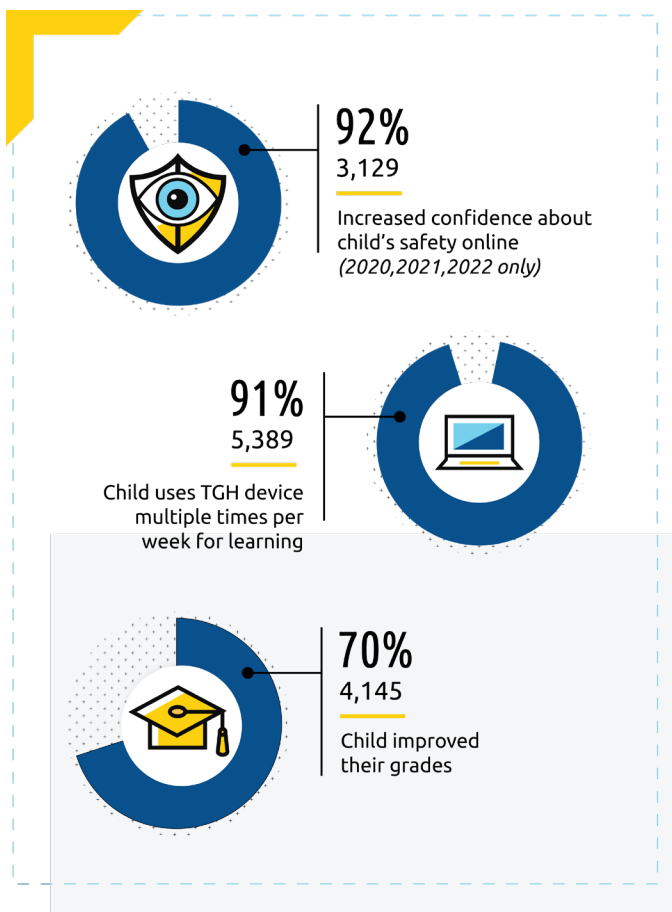
Figure 4. Student Impact

## Research Approach

The Digital Equity Research Center and Tech Goes Home team was guided throughout their collaboration by the following overarching research question:

*How can participatory research methods be used to develop a theory of change and an evaluation framework to benefit Tech Goes Home, its community, and the larger digital equity field?*

In addition, the following sub-research questions included: What opportunities and challenges do digital equity organizations face in conducting outcomes-based program evaluation?



What software do digital equity organizations use to conduct their evaluation? We believed that answers to these questions would also help situate our study within a broader national context during a time of unprecedented state and federal funding to advance broadband access and digital equity.

At the project start, the Digital Equity Research Center introduced the idea of using participatory action research as a method to further build upon TGH's existing program evaluation efforts and co-create knowledge with and for the TGH community. Because TGH staff members working on this project were already involved with the organization's data gathering efforts (as described above), and were interested in helping to organize additional interviews and focus groups for the project, PAR organically emerged as a possible research direction to develop a theory of change for TGH. Center and TGH staff agreed that the co-development of a theory of change would help to better align current program activities with present and future data gathering efforts.

During the initial phase of the project, the Digital Equity Research Center created and shared a presentation entitled "[Participatory Action Research: An Introduction](#)," with TGH staff. The presentation provided an opportunity for the two organizations to discuss how and why PAR might be the right research approach. In addition, the TGH Advocacy Team's focus on social justice provided alignment with the goals, objectives, and values of PAR, which is often focused on using research to address social injustice and structural inequality. As the TGH Advocacy page states,

*For decades, the digital divide has excluded thousands from accessing critical tools and resources essential to their livelihoods, disproportionately affecting low-income communities, communities of color, and seniors. Advancing sustainable digital equity also means tackling some of the injustices that perpetuate digital exclusion, including systemic racism and economic inequality, as well as educational and health disparities. In the long term, achieving digital equity will lead to greater racial and economic justice.*

After several discussions related to availability and capacity of TGH staff to join the project as researchers, the two organizations decided that PAR would be a good fit for the project. TGH and the Center cooperatively developed a broader research question that addressed their shared goal of advancing the digital equity field through co-production of knowledge.

The research sought to address a practical need around program evaluation at TGH, as well as a broader gap in the digital equity scholarship on the outcomes-based evaluation needs of similar organizations. The landscape analysis conducted during Phase 1 of our project helped to uncover some of the challenges and opportunities for organizations in their work to measure broader outcomes from digital equity initiatives. However, only a few recent publications (e.g., see Rhinesmith & Siefer, 2017<sup>15</sup>) have sought to investigate this specific

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15 <https://www.benton.org/publications/digital-inclusion-outcomes-based-evaluation>



research topic relevant to both researchers and practitioners in the digital equity field.

In response, the following research thumbnail describing the project was co-developed by researchers at the Digital Equity Research Center with practitioners at Tech Goes Home and submitted to an Independent Institutional Review Board for review and research exemption.

*In recent years, funders and other digital equity stakeholders have increasingly requested outcome-based evaluation frameworks from community-based organizations seeking support for new programs and services to help address the digital divide and advance digital equity. While previous studies have attempted to document the opportunities and challenges of developing such outcomes-based evaluation models, few have attempted to introduce a model that can be useful to the broader digital equity field.*

*This research project seeks to address this gap in the literature through a case study of Tech Goes Home in Boston, Massachusetts as it attempts to develop an open theory of change and evaluation framework that can be useful internally as well as to other digital equity stakeholders. The approach will begin with developing a deeper understanding of how staff, learners, instructors, and partners working with Tech Goes Home in Boston, MA can help to inform the development of an evaluation framework using qualitative methods. The study also seeks to gain insights from other experts across the country who work in similar organizations to Tech Goes Home.*

Participatory action research was useful to ensure that the qualitative data gathered from our interactions with TGH learners, instructors, and staff were informed by the everyday experiences of practitioners at TGH who also worked as co-researchers on the project. PAR was also a useful guide as we developed our participatory design workshop with TGH staff during Phase 1 of our project.

A further description of our research methodology is provided in Appendix I.

## **Participatory Design Workshop**

During Phase 1 of the project, our research team co-led a participatory design workshop with TGH staff. The goal was to inform the development of the theory of change and provide insights to help shape our instructor interviews and learner focus group discussions in Phase 2 of our project. In advance of the workshop, we sent out the following information to workshop participants to help them prepare.

*Thank you for agreeing to participate in this workshop. Your perspective is invaluable in clarifying our work and determining the direction of TGH moving forward. The goals of this workshop are:*

- **To provide organizational information that will influence the theory of change**
- **To identify organizational assets, outcomes, and needs**
- **To pinpoint how specific actions and interventions contribute to organizational goals**
- **To center the expertise of TGH staff in the theory of change research process**

*In order to give you some time to think about questions before the workshop gets started, we are sending you the main questions that will be asked during the session. That said, our goal is to have an organic discussion, so don't feel the need to be prepared with specific answers.*

- **How do you know when TGH has been successful or unsuccessful in the delivery of its programs?**
- **What attributes of TGH led to these successes or deficits?**

The workshop was created using participatory design techniques, including co-design activities with TGH staff to help shape the theory of change. For example, TGH staff were first prompted to center the knowledge deriving from their experience in their own role, then asked how they knew when TGH has been successful or unsuccessful in the delivery programs for participants, instructors (see Figure 1), TGH as an organization, the broader community, and themselves personally. They generated their own findings, then indicated alignment with others' via a dot exercise. Finally, the team engaged in a full debrief and discussion.

## **Listening to the TGH Community and Peer Digital Equity and Digital Inclusion Organizations**

After gaining initial insights and feedback from TGH staff during our participatory design workshop, we turned our attention to learn directly from those most impacted by TGH programs. In addition to inviting learners to share their experiences to help shape the theory of change, we also interviewed several leaders of digital equity organizations across the U.S.. The decision to invite outside organizations to participate in the study was motivated by a desire to gain a broader sense of the opportunities and challenges of designing a digital equity theory of change. Our research team also thought it would be an opportunity to

inform broader state and federal digital equity policy initiatives focused on working with community-based organizations to evaluate the outcomes and impacts of federally funded digital equity programs.

### **Learner Focus Groups**

In order to gain insights from learners who have completed a TGH course, a total of three focus groups were conducted. Two of these focus groups took place at the Codman Square Branch of the Boston Public Library (BPL) in the Dorchester neighborhood of Boston. The final focus group took place at the East Boston BPL branch, and was conducted bilingually in English and Spanish. Both branches have hosted numerous TGH courses over many years and are situated in predominantly Black and brown neighborhoods.

### **Instructor Interviews**

In addition to insights from learners, our research team also decided that it would be important to learn from the instructors who teach learners at community partner organizations. There were a total of seven instructor interviews conducted. One interview had two instructors from the same organization. Two of seven instructors worked for organizations outside the Boston Metro Area in Gateway Cities in other parts of Massachusetts. A complete list and description of the instructors and community partners who participated in this study is found in Appendix I.

### **Interviews with Organization Leaders**

In selecting organizations to interview, our research team searched online to find digital inclusion organizations that were somewhat similar to TGH in terms of the types of programs and services provided. A total of eight organizations from across the country participated in interviews. An effort was made to include organizations in a variety of locations that served diverse audiences. Organizations that primarily focused on grant-making or research were excluded in favor of organizations that had service models similar to that of TGH. Significantly, five out of the eight organizations are located in the Southern United States.

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## **Research Findings**

### **Outcomes for Learners**

In this section, we describe how findings from our qualitative data analysis informed the final version of the TGH theory of change presented in the next section. We begin with examples

from our focus groups with learners that help reveal some of the key short- and longer-term outcomes indicators included in the logic model presented in the next section. We then show how the interviews with instructors helped to identify ancillary outcomes for Tech Goes Home's instructors and community partner organizations in Massachusetts.

### Short-Term Outcomes

Overcoming the fear of using technology was a common short-term outcome measure that was often mentioned by TGH learners. As one of our focus group participants shared,

*"I did have a fear of using the computer before I took the course and I remember the fella says, 'You have nothing to be afraid of. Press the button. Do it.' And that's what I do now. I press the button."*

Another focus group participant talked about how a TGH course helped them to develop skills to use email technology and navigate websites online. As this participant described,

*I do a lot of grant searching...because of the technology, I can just look, just look up the grants and do the research....It has brought me closer to my goal 'cause otherwise I would still be doing a business plan and not getting it all set and ready to go. I contacted the city, got the name in order. You know, all these things is so convenient instead of going down, or getting on the phone, you can just email.*

These shorter-term outcomes provide evidence that skills gained during a TGH course lead to broader outcomes, such as increased employment, career opportunities, and entrepreneurship, as the example above highlights.

### Longer-Term Outcomes

Another way our team learned how to identify mid- and longer-term outcomes was by listening for increases in a learner's ability to achieve broader social and economic goals, such as increased self-confidence and civic engagement. Not only did focus group participants share their success with using word processing software to create their resumes (i.e., short-term outcomes), they also talked about social outcomes for their family members, such as being able to gain the confidence to produce digital media and impact others in their community, as this focus group participant shared about her older adult mother,

*My mom, she's 82. She wanted to know about computers. And at first she said, "I don't want nothing, I can't, I'm not going to change." But you guys offered a course while the pandemic was—while we were shut down. So me and my mom, she said "Okay. I'm going to do it." We did it together. It was awesome. My mom actually did a presentation at the end of her*



*course. It was so good. She learned how to do posters, flyers, you know. It was awesome. She had the class, the people crying because it was so nice. [The presentation was] about how important it was for her to learn about technology. Because you want to email your children. Like, now she's on YouTube [and] she can see her church.*

Interviews with TGH instructors helped to verify many of the outcomes described by learners during our focus group sessions. For example, as one instructor described about one of their learners in the following excerpt,

*She initially refused. She said, "I don't want a computer, I don't wanna go on the web. They're gonna steal my identity. I don't trust it." And now she, as Lydia said, she's actually going to a community college and taking more advanced digital skills training classes.*

Many of the mid- to longer-term outcomes mentioned by TGH learners and instructors that were included in the final version of our logic model were also verified by the literature review, which members of our team conducted during Phase 1 of the project.

## Ancillary Benefits for Community Partners

While the focus of this study was to learn about the outcomes and impacts of TGH programs on learners who complete TGH programs, our research team also discovered additional benefits for instructors who teach TGH courses at community-partner organizations. In the interviews, several instructors talked about the additional support that TGH provided to community partners, particularly related to digital skills training.

One of the instructors we interviewed was Ryan Beckett. Ryan works for Northern Essex Community College and provides digital skills courses for formerly incarcerated individuals through a partnership with the Essex County Sheriff's Department. Ryan talked about how valuable it was to have TGH as a partner in this work.

*And so this just seemed like such a natural fit. Like I already said, yeah, I had already been kind of running groups focused on these exact skills and just to have a support kind of nonprofit that can provide the hardware, that can provide the laptops, that can provide the gear that's actually make it happen and kind of have our participants carry the torch on their own is huge. So I think, yeah, that's it for the first part. It definitely fits very well with what we're doing.*

Ryan also described how the TGH website supported his computer literacy classes.

*The teacher, instructor page on their site is usually pretty helpful. There are a lot of great resources there. Yeah, like I said, the four fundamentals that they require us to teach in the community course at least, are the blueprint for my community curriculum that I have that I use as like a backbone. So I would say, yeah, I find their teacher, instructor page kind of helpful. I'm always looking for more resources.*

Debra Wald is the Adult Education Instructor & Case Manager at Project Place in Boston, which works “to provide opportunity for individuals experiencing homelessness and poverty by providing the skills, education and resources needed to obtain and sustain employment and housing.”<sup>16</sup> Debra also shared how their partnership with TGH helps them to develop their curriculum.

*'Cause now we do a Zoom class in the mornings, the computer class a couple days a week in person, so it just makes it easier for them to access their classes, do their homework, everything like that. And yeah, and then just also helping inform us with what types of topics to cover in our classes. So I know that that helped shape originally when this class was planned out, what to cover in this course. And I know we kind of built on top of that as well. So yeah, I think it's kind of been a really natural fit for what we're doing in terms of what our clients need access to, but also just what kinds of skills they need in terms of getting back out into the workforce.*

These ancillary findings align with TGH's own internal understanding of their impact on partners, and suggest that TGH should consider additional data gathering efforts to gain a deeper understanding of the outcomes and impacts for instructors and community partner organizations.

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## Theory of Change

### Co-Designing a Digital Equity Logic Model

After completing our focus groups with learners and our interviews with instructors hosted at TGH community-partner organizations, our research team worked with the data to develop an initial version of the TGH logic model that could be shared with TGH staff for feedback and further iteration. To create this initial version of the logic model, the team created short-term and longer-term outcomes that were presented in the previous section.

<sup>16</sup> <https://projectplace.org/about/mission-and-values/>

Short-term outcomes, as discussed above, are outcomes experienced by learners at the end of a TGH course. Mid- to longer-term outcomes, also introduced in the previous section, were identified by analyzing previous data collected by TGH staff through follow-up phone calls with learners 6 months to 1 year after a learner had completed a course.

For our research, the focus group participants included learners who graduated five years earlier and therefore helped reveal longer-term outcomes that we included in the final version of the logic model. Table 1 shows examples of some of the short-term and mid- to longer-term outcomes that were included in the final version of the TGH logic model presented in the next section.

**Table 1. Examples of short-, mid-, and long-term outcomes for learners**

SHORT-TERM OUTCOMES	MID- TO LONG-TERM OUTCOMES
Ability to feel more confident using technology	Increased self-confidence
Ability to use word processing	Increased self-sufficiency
Ability to use job searching sites and application platforms	Increased employment
Ability to write and submit online resumes	Improved health outcomes
Ability to apply for and manage government benefits online	Increased early literacy levels

The inputs, activities, and outputs included in the logic model came from discussions with TGH staff with greater knowledge of the organization’s overall programs and services, including the types of funding, resources, and technology needed to support TGH learners. It was also decided that core competencies needed to be called out as an important focus of the logic model. The impacts in the logic model were based upon National Digital Inclusion Alliance’s definition of digital equity, as the ultimate goal of TGH programs.

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## Insights from Outside Organizations

As we described in our research methodology, this study also sought to gain insights from outside organizations that were not formerly connected to Tech Goes Home. We spoke to individuals at several organizations (listed in Appendix I) to learn more about their experience with outcomes-based evaluation and the challenges they faced developing a theory of change and using it to help with their program evaluation efforts. We also learned more about the software used for internal digital equity program evaluations and what some of their recommendations and advice were for those new to digital equity evaluation.

There were three main themes that emerged from our discussions: (1) measuring broader outcomes in an accurate, inclusive, and community informed way is challenging; (2) evaluation software is often expensive because it requires customization; and (3) digital equity programs that rely on community partners often require additional evaluation efforts.



This section further elaborates on each of these areas as a way to provide additional context and to call attention to the issues that were raised and identified in our research project.

## Measuring Broader Outcomes is Challenging

One of the resounding messages heard from our analysis of interviews with outside organizations was that it is hard to measure the broader social and economic outcomes of digital inclusion programs. As Deb Socia, Executive Director of the Enterprise Institute in Chattanooga, TN explained,

*What we had to do was really start with understanding how you write an objective that helps us to actually measure it. Some of this work is so hard to measure and so this past year we have been playing with the measurement tools and trying different things . . . We haven't found the perfect way to measure everything yet.*

*The question is not, did they successfully complete the training? The question is, did they get a job? So to me, we're looking at data that doesn't tick a box, but rather changes something fundamentally that makes the person's life better in an area they have defined for us. I need help doing X. How do we make sure we help people actualize that outcome for themselves?*

Measuring outcomes is often challenging because of the difficulty many digital inclusion organizations have with proving causality, e.g. an individual who takes a digital literacy class experiences positive social, economic, educational, and health outcomes as a direct result of having taken the class. These are hard things to measure, particularly when it comes to proving the effects of digital inclusion programs. As Ines Escandón, Director of Impact Measurement and Learning at Older Adults Technology Services (OATS) from AARP explained,

*The biggest challenge has been identifying how to define impact. We have outcomes, mid-level outcomes, activities, and expected results linked to impact. We're still trying to formulate what we see as impact. OATS has historically had five impact areas: financial security, creative expression, civic participation, health and wellness, and social engagement. We wanted to identify impact for those five areas and had a consulting group do an exhaustive review to see what we could come up with in terms of metrics that would address those impact areas. Interestingly, we only found about three of them were covered out of that list of five: social engagement, health and wellness, and financial security.*

As a result of these measurement challenges, many digital equity initiatives often settle with measuring outputs rather than broader outcomes, as Adam Sharma, Vice President of Strategic Innovation and Partnerships at Human-I-T described,

*So what it currently looks like is one of the biggest issues in our industry, and by industry I mean non-profits. We typically measure outputs instead of outcomes. Obviously measuring outcomes is a much bigger challenge. And we've only been doing this for 10 years, so some of those follow-ups and some of those real outcomes happen a lot longer on a much longer time scale, right?*

This challenge related to measuring broader outcomes is certainly not a surprise, nor is it new, for those who lead digital equity program evaluation initiatives. In fact, one of the main takeaways from the 2017 Benton Foundation report titled “Digital Inclusion Outcomes-Based Evaluation”<sup>17</sup> written by Dr. Colin Rhinesmith and Angela Siefer, Executive Director of the National Digital Inclusion Alliance was the need for outcomes-based evaluation tools and implementation support.

## Program Evaluation Software is Expensive

The second take away from our interviews with peer organizations is that not only is outcomes-based evaluation challenging, the software required to collect data to show outcomes is expensive. This is because the software requires customization from IT professionals to adapt the technology to meet the needs of digital equity organizations, as Kami Griffiths, Executive Director of Community Technology Network described,

*We've been using Salesforce for 10 years, but it was being used poorly because it wasn't set up correctly and staff weren't trained. After the Metta Fund grant we hired a consultant to map out how it needed to be updated and had an internal contractor make some of those updates. We ultimately hired a part-time Salesforce admin to do more customization and another full-time staff person to do data quality. We started using it because of the 10 free licenses, but we didn't know what we were getting ourselves into. They really suck small nonprofits in because of those 10 free licenses.*

Cari DelMariani, Director of Programs at the Kramden Institute agreed.

*Yeah, Salesforce for nonprofits I think is technically free. I think that's where they get you and why so many nonprofits use it, but you have to customize it so much. And I will say though, we have paid a lot of money to the consultants that help us over the years, but I think it's well worth it.*

Susan Corbett, Executive Director of the National Digital Equity Center explained how she invested significant funding in DITTO<sup>18</sup>, a software program designed by Samantha Schartman to assist digital inclusion organizations with their evaluation efforts during the Broadband Technology Opportunities Program<sup>19</sup> era. As Corbett explained,

*At the National Digital Equity Center, we use DITTO, a cloud-based data collection program that is housed on a virtual private and secure server. We have a stand-alone database, and work directly with the developers and programmers. As our programs change and develop, we can consult with the programmers to add additional fields and components. The DITTO platform collects all of the demographic information that aligns with US Census data. All of the data is behind a secure firewall, which allows us to report out on the aggregate data. I can say things like "Colin, 57% of our students are 55 years old and older, or 30% of our students are unemployed". We can also break down the demographics and class enrollments by county. We can see how many students and what classes they have taken on a county by county level. This allows us to adjust our public awareness campaign to reach the areas that student enrollment is lower.*

This example from Susan Corbett shows that while the investments in program evaluation software can be quite substantial for small nonprofits, the results can be helpful for digital equity organizations working to show the outcomes for learners in their programs.

## Evaluating Programs with Community Partners Requires Additional Work

Another finding from our interviews with peer organizations was that Tech Goes Home is not the only digital equity program in the country that relies on other community-based organizations for their service delivery. Inspiredu in Atlanta, Older Adults Technology Services (OATS) from AARP headquartered in NYC, and the Kramden Institute in Durham, North Carolina are just three organizations that are similar to TGH in this way.

This model of service delivery raised several questions related to how organizations like

<sup>18</sup> <https://www.connectedinsights.org/ditto>

<sup>19</sup> <https://www.ntia.gov/category/broadband-technology-opportunities-program>

## Tech Goes Home Theory of Change

INPUTS	ACTIVITIES	OUTPUTS	CORE COMPETENCIES	SHORT-TERM OUTCOMES	MID- TO LONG-TERM OUTCOME	IMPACTS
<p>In order to accomplish the activities in this logic model, we will need the following resources:</p>	<p>In order to advance our mission, we will accomplish the following activities:</p>	<p>Once the activities are accomplished, we expect they will result in the following evidence of successful service delivery:</p>	<p>We expect that if served successfully, all graduates will be equipped with the following foundational skills:</p>	<p>We expect that as learners achieve their own goals, outputs and core competencies will lead to the following changes in knowledge, skills, abilities:</p>	<p>We expect that if achieved successfully, the short-term outcomes will lead to broader outcomes at the individual, family, and community levels:</p>	<p>We expect that if achieved successfully, the mid- to long-term outcomes will lead to the following broader impacts in our society:</p>
<ul style="list-style-type: none"> <li>• Private funding</li> <li>• Public funding</li> <li>• Private-public partnerships</li> <li>• Community outreach</li> <li>• Devices to distribute to learners, instructors, and course sites</li> <li>• Affordable internet services to distribute to learners</li> <li>• Volunteers to create self-learning tutorials and translation</li> <li>• Partner organizations to host instructors that teach TGH learners</li> <li>• Instructors recruited to teach learners</li> </ul>	<ul style="list-style-type: none"> <li>• For Learners</li> <li>• Help learners gain access to internet-enabled devices</li> <li>• Help learners gain access to low-cost internet service</li> <li>• Help learners gain access to digital skills courses</li> <li>• For Community Partners</li> <li>• Train instructors to recruit learners, deliver courses, and manage course logistics</li> <li>• Provide core competency training, sample curriculum, learning outcomes, and templates</li> <li>• Provide ongoing support to instructors</li> </ul>	<ul style="list-style-type: none"> <li>• # of community partners running courses for learners</li> <li>• # of courses completed by learners</li> <li>• # of learners graduating TGH courses</li> <li>• # of new instructors (esp. former learners)</li> <li>• # of instructors retained</li> <li>• # of devices distributed</li> <li>• # of learners set up with an internet connection</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to navigate computer basics, settings, and files</li> <li>• Ability to use email</li> <li>• Ability to effectively use Chrome and Google Search</li> <li>• Ability to use video chat platforms</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to feel more confident using technology</li> <li>• Ability to use word processing</li> <li>• Ability to use job searching sites and application platforms</li> <li>• Ability to write and submit online resumes</li> <li>• Ability to apply for and manage government benefits online</li> <li>• Ability to identify fraudulent websites and emails</li> <li>• Ability to safely and securely navigate the internet</li> <li>• Ability to use a tablet for early childhood education</li> <li>• Ability to navigate patient health portals</li> <li>• Ability to use classroom platforms such as Google Classroom and Blackboard</li> <li>• Ability to log into grade and parent portals</li> <li>• Ability to use online banking and budgeting tools</li> <li>• Ability to make community connections</li> </ul>	<ul style="list-style-type: none"> <li>• Increased self-confidence</li> <li>• Increased self-sufficiency</li> <li>• Increased career opportunities, including entrepreneurship</li> <li>• Increased employment</li> <li>• Improved health outcomes</li> <li>• Increased early literacy levels</li> <li>• Increased caregiver involvement in child(ren)'s education</li> <li>• Increased caregiver participation in school governance and events</li> <li>• Increased caregiver-teacher communication</li> <li>• Increased educational opportunities</li> <li>• Increased involvement in community groups</li> <li>• Increased civic engagement</li> <li>• Increased ability to attain citizenship</li> <li>• Increased housing stability</li> <li>• Decreased feelings of anxiety, loneliness, and isolation</li> <li>• Decreased recidivism</li> </ul>	<ul style="list-style-type: none"> <li>• All individuals, families, and communities have the information technology capacity needed for full participation in our society, democracy, and economy, including civic and cultural participation, employment, lifelong learning, and access to essential services.</li> </ul>

Adapted from W.K. Kellogg Foundation "[Evaluation Handbook](#)" (1998), Samantha Becker, et al. (2010) "[How the American Public Benefits from Internet Access at U.S. Libraries,](#)" and Institute of Museum and Library Services (2012) "[Building Digital Communities: A Framework for Action](#)" and Colin Rhinesmith and Angela Siefer (2017) "[Digital Inclusion Outcomes-Based Evaluation](#)."

these are able to measure the outcomes and impacts of their programs not only for those individuals who benefit from services, but also for the community-based organizations with whom they partner. As Ines Escandón, Director of Impact Measurement and Learning at OATS explained,

*One of the things that we're looking at is how to measure the impact you can create for other organizations, because so much of what we do is through other institutions. We have a licensing program where we work with other institutions across the country to bring Senior planet programs to older adults locally. Trying to solve for this impact question and essentially measure your influence with other institutions has been really challenging, but I think it's important. It'd be great to see other organizations working on that particular topic, and I'd be interested to see what people come up with.*

The Kramden Institute in North Carolina has a train-the-trainer model where they partner with public housing authorities to provide their services. As Cari DelMariani, Director of Programs at the Kramden Institute explained,

*So for example, in Fayetteville, we train, it's a two-day training. So we'll train someone who works at the public housing authority, I'm just using Fayetteville as an example. And then someone who lives in Fayetteville public housing, a resident. So they would come here together and they would get two days of training on how to deliver that computer basic class. And we would send them back with all the resources, the curriculum and the laptop computers. They deliver that program, and we pay them each a \$500 stipend per session that they teach, that's per eight hour session. And as long as we can provide funding, that's just a really easy way for us to get the program out.*

However, when it comes to evaluating the outcomes and impacts on the public housing authority, this takes a bit more effort. Cari continued,

*So, this is something that I've been working on for a couple of years now. Kind of slow going. We used to use a variety of different methods to track everything from computers going out, to partners, to donors, everything. We've used a number of different softwares over the years, I can't even name all of them. But a couple years ago, I decided to move from Salesforce as our primary software to Zoho One.*

Despite its challenges, organizations like OATS and Tech Goes Home understand through talking directly with their community partners that their organizations can potentially have an even greater impact because of this partnership model. Program evaluation efforts,

in turn, are often driven by the needs of community partners, as Richard Hicks, CEO of Inspiredu told us,

*Program evaluation centers a lot around the partnerships. I've been doing this work over 15 years, and being able to see how valuable the evaluation process comes within your program when you're having deep discussion with your partners on what's needed, where are you going to target, who is actually going to be needing these resources? So that helps you to kind of adopt the program evaluations that you'd be able to basically use.*

Hicks explained that program evaluation has to be flexible in order to be responsive to the needs of community partners and to be iterative in its ability to learn from doing in the partnership model. As Hicks explained,

*We're not trying to go too far off of our mission and develop things that we're not good at. But what we wanna do is be able to target where we can actually make an impact within our partnerships of specific clients or specific community based organizations. It helps us to be able to have that discussion so that when we do go back and we evaluate our program, we know we actually touched on the points we needed to touch on.*

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## Recommendations

In this section, we turn to sharing insights from our project that can be useful for digital equity organizations and state agencies interested in collecting data to support outcomes-based evaluation. We also share recommendations for state and federal policymakers working with community-based organizations to support broadband adoption and digital equity.

### For Tech Goes Home

Tech Goes Home collects a significant amount of data—more than most similar organizations across the country. At the outset of this project, Tech Goes Home sought to narrow the scope of their evaluations by identifying five to ten key metrics that could measure the impact of TGH programs on learners. However, over the course of engaging with TGH staff members, instructors, and learners, findings consistently suggested that TGH was not gathering enough data, and could benefit from an expanded list of evaluation questions and targets.

**Gather data on outcomes for community partner organizations.** Based on conversations with TGH staff and instructors at partner organizations, we were able to see that TGH programs had positive impacts on the staff and work of community partners, as shown in examples from our instructor interviews presented earlier in this paper. However, we were unable to incorporate this into the larger theory of change because of limited data. As our research team initially set out to examine the outcomes for learners, our data collection was not focused on the outcomes of these partners. TGH staff has since recognized this as a site for expansion, such as through surveys of partner organizations. Table 2 below shows examples of some of the short-, mid-, and long-term outcomes based on discussions with TGH staff during this research project.

**Table 2. Examples of short-, mid-, and long-term outcomes for community partners**

SHORT-TERM OUTCOMES	MID- TO LONG-TERM OUTCOMES
<ul style="list-style-type: none"> <li>• Increased trust and familiarity with service audiences</li> <li>• Ability to deliver programs remotely</li> <li>• Greater number of people reached with digital programming</li> <li>• Previously inaccessible populations reached with digital programming</li> <li>• Professional development for site staff</li> <li>• Staff time freed from tech support</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced ability to deliver on mission by integrating digital resources</li> <li>• Participants’ increased and sustained engagement with partner sites</li> <li>• Greater funding and/or expansion as a result of partnership with TGH</li> <li>• Accelerated staff development and growth</li> </ul>

These outcomes can serve as an important starting point in the future for TGH as they develop additional evaluation tools to understand the outcomes and impacts of TGH programs and services on instructors and community-partners.

**Collect data on advocacy outcomes.** Members of the advocacy team at TGH were key partners in this participatory action research project. Throughout our collaboration, our research team spent a great deal of time discussing how we might include the work of the TGH advocacy team in the logic model. While the advocacy team at TGH has identified that addressing the digital divide requires tackling structural inequality and systemic injustice, such as racism and poverty, future evaluation efforts at TGH should include gathering data to show the outcomes and impacts of the advocacy team’s activities. Articulating and making these connections will not only help to illustrate program efficacy, but also to show how TGH’s mission and vision actualizes social, economic, and racial justice goals.

**Continue engaging researchers to measure community-level impacts.** TGH understands that the impacts of their programs are likely felt not only by direct participants, but by those participants’ families, neighbors, and communities. However, TGH data collection does not include community-wide indicators and their relation to long-term digital equity goals. Continuing to engage the expertise and outside perspective of researchers can help to identify those indicators. What we learned over the course of this project is that

participatory action research, and other research-practice based approaches, are helpful in identifying broader outcomes and impacts that are typically more difficult to capture. Building on the success of this collaboration, Tech Goes Home could partner with additional researchers for further analysis, for example with developing an equity-focused evaluation.

## For Digital Equity Organizations

**Allocate time, money, and intentional effort to capture insights and expertise from community members.** Recent discussions in the digital equity field, both at practitioner conferences and in other spaces where digital equity researchers are gathering, have argued that organizations must pay community members to gain their expertise and participation in program evaluations. As Deb Socia, Executive Director of the Enterprise Center (formerly ED of Tech Goes Home in Boston) argued,

*The other thing we did, so you know, is we paid them. I find it so frustrating when people expect the expertise of community members and they don't get a payment. We also paid the parents who participated in the interviews. I think that we garnered their expertise often without valuing it the way we should. And in this case, we were able to do so and I think it really made a difference. It also helped us build more trust.*

There is general consensus across the field that this is simply the right thing to do, particularly when asking low-income individuals and families who are often working several jobs to participate in something from which they might not see immediate benefit.

**Engage evaluation participants in their native languages.** Digital equity organizations that serve learners who speak multiple languages should work to ensure that their needs are considered in program evaluation efforts. These populations are likely to face compounded barriers to both digital inclusion and survey participation, and their experiences are therefore crucial to accurately understand the impact of programs. For example, making sure there are translated consent forms that clearly explain the purpose, goals, and any benefits of participation are ethical and respectful steps to ensure that non-native English speakers are included in program evaluation efforts in meaningful ways.

**Work with funders to balance reporting requirements with sensitivity to participants' privacy and attention to self-defined measures of success.** Other digital equity organizations identified that one of the significant challenges they face is the need to gather data to show funders the outcomes and impacts of their financial support, while also showing community members why these activities are mutually beneficial. There can also be challenges in marrying what a funder requests and what the organization knows is perhaps a more representative indicator of success. As Cari DelMariani, Director of Programs at the Kramden Institute told us,



*Really, they [funders] just wanna know that we did the program... And they wanna know the numbers, right? But for us, the numbers are just one kind of, that's a great indicator, but we wanna really see that increased confidence, for example, and we wanna see people getting jobs.*

Kami Griffiths, Executive Director at Community Tech Network added,

*If we wanted to tell the story to funders and other stakeholders of what we'd accomplished we were collecting number of learners, perhaps number of training hours, languages that we were using, and number of volunteers. It was very activity based and not what's the change in the world that we're making. So we have had a decade of work that wasn't really captured very well.*

Another challenge comes when asking sensitive information of participants in digital inclusion programs. This can further compound the challenges of meeting funders' expectations of showing impact of programs. Therefore, organizations must take extra steps to ensure that they are protecting the privacy of their participants. Tech Goes Home has found success in working with funders to identify accurate measurements of success and establish respectful guidelines that ensure program evaluation is compelling, representative, and responsive to community needs.

### **Advice from Peer Organizations**

The individuals from other digital equity organizations who we interviewed for this study were asked to share their advice and feedback for other organizations across the country who are perhaps new to the field, particularly when it comes to using outcomes-based evaluation in their programs. This section highlights some of the important messages that we heard.

Digital equity organizations should stay focused on what they do well. Because the priority of funders can change over time, thus making program evaluation a moving target, we heard from our interviewees that it's important for organizations in the digital equity field to stay true to their mission and the communities they serve. As Richard Hicks, Executive Director of Inspiredu in Atlanta, Georgia explained

*Every organization needs to have a nucleus, every... Look at them. The ones that are successful, they have a nucleus. You're gonna sprout tentacles. You're gonna have different things that you're gonna do that may be in other places, but you got to have a nucleus, you got to have what you're known for and don't ever tamper with that.*

**Provide support to community partners when they are asked to gather sensitive**

**information.** Digital equity organizations—like Tech Goes Home and others who we interviewed for this project who work with community partners to provide their programs and services—should co-create meaningful and respectful ways to address privacy concerns mentioned above. One way to do this is to take the lead on gathering this information and avoid placing the burden on community partners. Susan Corbett at National Digital Equity Center offered this excellent advice,

*Every student in our program, whether they are taking a class, or requesting a device – every program that we offer – must complete an enrollment registration form. If someone says “I am not filling out the form” – that is perfectly fine, we are just not going to provide services. It’s as simple as that. We have funders that we are responsible to, and the enrollment registration form is a way to ensure tracking data, and to show that we are reaching the people we want to reach, our most vulnerable Mainers.*

*Often, on a local level, the librarian or adult education director asks the student to complete the enrollment registration form, and there might be some resistance because the student is their friend or neighbor. When that happens, the local leader can suggest that the student go into a private room and call the National Digital Equity Center to help complete the enrollment registration over the phone in a private setting. Our administrative staff is very used to handling these situations and asking the registration questions in a very impersonal way.*

**Listen to your community, ask them for advice.** Most of the people from peer organizations who we interviewed for this study relied on the knowledge, expertise, and wisdom of their community members and partners. Particularly in helping to define what success of their digital equity programs look like. Therefore, it’s essential that digital equity organizations develop deep ties and connections with people and leaders in their communities to ensure that digital equity programs address their needs and inform further opportunities to work towards digital equity and social justice.

## For State and Federal Policymakers

As the National Telecommunications and Information Administration (NTIA) plans to provide \$42.45 billion to expand high-speed internet access through the Broadband Equity, Access, and Deployment (BEAD) Program, and much less to fund digital equity<sup>20</sup>, our research team discovered several findings from this study that we believe can be useful for NTIA and state

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20 NTIA will provide \$1.44 billion for states, territories, and tribal governments as part of their Digital Equity Capacity Building Grant Program and \$1.25 billion for the Digital Equity Competitive Grant Program to fund digital equity projects over the next five years. <https://broadbandusa.ntia.doc.gov/funding-programs/digital-equity-act-programs>.

governments as they work to create, award, and evaluate funding opportunities for digital equity organizations over the next five years.

**The success of broadband infrastructure programs relies on digital equity funding.**

One of the major findings from this research collaboration was that all three elements of TGH's program—devices, internet, and digital skills training—were necessary to achieving the outcomes and impacts identified. Community members cannot access the digital world without affordable and reliable internet service, internet-equipped hardware, and hands-on support in making use of it. When evaluating the success of broadband deployment, administering entities must also consider whether communities have access to the digital equity programs necessary to make use of broadband access.

**Set aside funding that organizations can use to conduct program evaluation.** Digital equity organizations have been arguing for years that if funders expect them to show the outcomes and impacts of their investments, the organizations should be compensated to do this work. Because program evaluation is time-intensive particularly when engaging covered populations, state and federal entities should allocate funding that can be used by digital equity organizations to measure the success of their state or federally funded programs as part of contracts.

**Provide technical assistance on program evaluation for digital equity organizations.** In addition to funding, state and federal entities should provide technical assistance to support digital equity organizations in conducting outcomes-based evaluation. Counting outputs, such as numbers of digital skills classes offered or numbers of computers distributed, is a much easier task for organizations. However, if digital equity organizations are required to show the mid and longer-term outcomes, as detailed in the Tech Goes Home logic model in this report, then technical assistance must be provided by state and federal entities to help local organizations, particularly under-funded nonprofits, with this work.

**Allow and encourage organizations to use government funding to compensate community members for their expertise.** State and federal agencies should require grantees that receive funding to implement and evaluate digital equity programs to provide evidence that community members were engaged in determining what the success of these programs look like. In other words, asking people about their experiences participating in a digital equity program is one thing. Asking these same people to provide their knowledge, expertise, and feedback on these programs before they start and when they are being evaluated is another thing. State and federal agencies should also ensure that compensating community members for their expertise be allowable as a budgetable expense. If this unprecedented federal funding is truly to make an impact, then those most impacted by digital inequalities must be included as partners in the creation, implementation, and evaluation of these programs. This process can also help not only to build capacity within an organization, but also ultimately ownership of these community-led initiatives to address structural inequities often tied to digital inequality.

# Appendix I. Research Methodology

## Participatory Action Research Approach

Participatory design is both a research methodology and a design practice that's often associated with the work of including users of computer systems in the creation of these systems. PD emerged during the 1970s as computers were introduced into industrial workplace settings and grew in response to the negative effects of technology, such as deskilling and dislocation of workers. Several Scandinavian countries saw the potential of PD, during this time, to address the growing power imbalances between workers and their employers. Researchers began working with unions to include workers in decisions about technological systems design. One goal was to ensure that workers would retain some level of ownership and control over their knowledge about technology, which they saw as integral to their ability to negotiate their working conditions. Scholars have noted PD's potential in bringing researchers and workers together to build knowledge about technology, formulate their goals, and promote their interests. (Rhinesmith et al., 2020)<sup>21</sup>.

## Data Collection & Analysis

This section details the approach our research team took in conducting this participatory action research project. After the research plan was established by the team at the Digital Equity Research Center and Tech Goes Home, Dr. Rhinesmith submitted a request to Ethical & Independent Review Services<sup>22</sup> for exemption from the requirement of Institutional Review Board approval beyond an initial assessment to confirm the exemption was claimed correctly. This approval allowed the research team to move forward with the study using the appropriate research methodology, which is described below.

## Research Participants

### Learners

A total of three focus groups were conducted with learners who completed TGH courses. Two of these focus groups took place at the Codman Square Branch of the Boston Public Library (BPL) in the Dorchester neighborhood of Boston. The final focus group took place at the East Boston BPL branch. Both branches have hosted numerous TGH courses and are

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21 Colin Rhinesmith, Jo Dutilloy, Susan Kennedy, Laurenellen McCann, Chris Ritzo, Georgia Bullen, & Stephanie Stenberg. (2020). ["Co-Designing an Open Source Broadband Measurement System with Public Libraries."](#)

22 <https://eandireview.com/>

situated in predominantly Black and brown neighborhoods.

Generally, learner demographics aligned with overall demographics for TGH participants listed in the [2022 Impact Report](#), with some notable exceptions as seen in Table 3.

**Table 3. Focus Group Participant Demographics**

Category	2022 Impact Report Percentage	Focus Group Percentage
Women	68%	100%
Household Income Below \$50k	90%	100%
Speak a Language Other Than English at Home	54%	45%
Latinx/Hispanic	35%	36%
Black/African American	34%	55%

Out of the 11 participants, 10 reported income. All respondents had household incomes below \$40,000. Four out of 10 had household incomes under \$20,000. It is important to note that several instructors discussed how immigrant participants often didn't understand and/or were unfamiliar with the term household income and conflated it with (the sometimes identical) personal income.

All 11 participants reported current employment status:

7 reported part-time work (with one of these saying "part-time/student")

- **1 reported full-time work**
- **1 reported retired**
- **1 reported unemployed**
- **1 reported unemployed/retired**

There was limited data for employment status at the course start (6 out of 11 respondents). However, 4 out of these 6 had moved from unemployed at the time of the course to part-time employment at the time of the focus group. While notable, it is important to note that correlation does not automatically equal causation.

Out of the 11 participants, 9 reported race/ethnicity (though the other two reported in person, both as Latina). Five out of the 11 were immigrants and spoke a first language other than English (4 Spanish, 1 Arabic). All participants were women of color. One participant identified as white on the form and said she was Middle Eastern in person. This is a fairly common reaction, as the U.S. Census classifies people of Middle Eastern and North African (MENA) descent as white despite many of the experiences of people of MENA descent having experiences more in line with that of people of color.<sup>23</sup>

23 <https://www.npr.org/2022/02/17/1079181478/us-census-middle-eastern-white-north-african-mena>

**Table 4. Demographics of Focus Group Participants**

Race/Ethnicity	Number of Focus Group Participants	Percentage of Focus Group Participants
Black/African-American	6	54.5%
Hispanic/Latino	4	36.4%
Middle Eastern/North African	1	9.1%

## Instructors

There were a total of seven instructor interviews conducted. Little data is readily available to compare how these demographics align with TGH-wide instructor demographics. The number of students taught over time ranged from five to over 1300. One interview had two participants from the same organization. For demographic purposes, this section will focus on the contacted (and primary) respondent. Two out of the seven instructors were men, while five were women. Two out of seven instructors worked for organizations outside the Boston Metro Area in Gateway Cities in other parts of Massachusetts. As TGH has just recently been expanding to other parts of the state, this is a significant portion of the interviews. A breakdown of participating organizations is found below in Table 5.

**Table 5. Community Partner Organizations**

Community Partner Organization	Location	Primary Audience Served
<a href="#">El Centro Adult Education</a>	Roxbury, Boston, MA	Adult immigrants and low-income individuals
<a href="#">Way Finders</a>	Springfield, MA	People in need of affordable/sustainable housing and those needing workforce development
<a href="#">Star Center Lynn</a>	Lynn, MA	People reentering after incarceration
TGH Hub (primarily for instructors who teach at numerous organizations without a particular affiliation)	Various locations	Various audiences, including those with visual impairments
<a href="#">Project Place</a>	South End, Boston, MA	Houseless individuals and workforce development
<a href="#">Rafael Hernandez K-8 School</a>	Roxbury, Boston, MA	Adult immigrants and caregivers of BPS students
<a href="#">BPS Parent University Technology Center</a>	Multiple locations across Boston, MA	Early childhood learners and caregivers of Boston Public School students

## Staff Workshop Participants

A total of 16 TGH staff members took part in the participatory workshop. As it was important to get feedback from across the organization, an effort was made to include people from various departments. The department breakdown is found in Table 6.

**Table 6. Characteristics of TGH Staff**

Department	Number of Participants	Percentage of Participants
Advocacy	3	18.8%
CEO/President	1	6.3%
Development	2	12.5%
Human Resources	1	6.3%
Learning/Education	2	12.5%
Operations	2	12.5%
Partnerships	3	18.8%
Program operations	2	12.5%

### Peer Organizations

A total of eight organizations from across the country participated in interviews. An effort was made to include organizations in a variety of locations that served diverse audiences. Organizations that primarily focused on grant-making or research were excluded in favor of organizations that had service models similar to that of TGH. Significantly, five out of the eight organizations are located in the Southern United States.

**Table 7. List of Peer Organizations**

Organization	Location	<u>Geographic Division</u>
<a href="#">The Enterprise Center</a>	Chattanooga, TN	East South Central
<a href="#">Community Tech Network</a>	San Francisco and Austin, TX	Pacific and West South Central
<a href="#">Austin Free-Net</a>	Austin, TX	West South Central
<a href="#">OATS from AARP</a>	New York	Middle Atlantic
<a href="#">Human-I-T</a>	Los Angeles	National
<a href="#">National Digital Equity Center</a>	Maine	New England
<a href="#">Kramden Institute</a>	Durham, NC	South Atlantic
<a href="#">Inspiredu</a>	Atlanta, GA	South Atlantic

### Data Analysis

After the data were gathered, the focus groups and interviews were transcribed and uploaded into Dedoose where they were coded and analyzed by our team.<sup>24</sup> After reviewing different approaches to qualitative analysis that could be jointly conducted by several members of our team, Dr. Rhinesmith decided that holistic coding would be the most appropriate and effective coding method for this participatory action research project, particularly given the limited time period for analysis and final reporting, as well as the introduction of new researchers into the qualitative analysis approach.

24 <https://www.dedoose.com/>

Saldaña described holistic coding as “appropriate for beginning qualitative researchers learning how to code data and studies with a wide variety of data forms.”<sup>25</sup> It can also be useful, Saldaña explains, when the researcher already has an idea of what to investigate (i.e., learner articulated outcomes of digital skills training). This approach allowed our research team to apply outcomes-based codes to larger blocks of data as a first-level or initial coding method. Table 8 shows some of the codes that were applied to the qualitative data in Dedoose.

**Table 8. Examples of short-, mid-, and long-term outcomes codes for learners**

SHORT-TERM OUTCOMES	MID- TO LONG-TERM OUTCOMES
<ul style="list-style-type: none"> <li>• Can Access City Resources</li> <li>• Can Monitor Child(ren)’s Media Consumption</li> <li>• Can Move Cell-Phone Pics to Phone</li> <li>• Can Spot Misinformation</li> <li>• Devices for Child(ren)’s Education</li> <li>• Device Ownership</li> <li>• Finding Free Summer Programming for Kids</li> <li>• Meeting New People</li> </ul>	<ul style="list-style-type: none"> <li>• Address Digital Divide</li> <li>• Can Take English Courses</li> <li>• Decreased Isolation</li> <li>• Decreased Technophobia</li> <li>• Finding Employment</li> <li>• Improved Quality of Life</li> <li>• Small Business Ownership</li> </ul>

From there, our research team sorted the codes into short-term outcomes (generally practical skills gained following a class) and mid- and longer-term outcomes that were identified with participants who had taken a TGH course several years earlier.

In addition to the codes listed above, our research team was able to identify outcomes-based codes identified by TGH staff that were used in comparison with what we heard from focus group participants, as a way to gain multiple perspectives for the study. Examples of staff-defined learner outcomes codes can be found listed below.

- **Economic Mobility**
- **High Instructor Retention Rate**
- **Improved Digital Literacy**
- **Improved Health Outcomes**
- **Increased Access to Technology**
- **Increased Telehealth Usage**
- **Instructor Continuing Education**
- **Instructors as Community Anchors**

25 Saldaña, J. (2016). *The coding manual for qualitative researchers*. SAGE.



- **Learned to Help Their Family Become Digitally Literate**
- **No Longer Fearing Technology**
- **Positive Outcomes for Instructors**
- **Well-Being**

A final list of outcomes-based codes, along with a list of TGH staff-identified inputs, activities, and outputs, were categorized and organized in a separate spreadsheet outside of Dedoose. These final lists of inputs, activities, outputs, and outcomes were then added to the first version of our logic model, which we shared back with TGH staff for review and feedback. The final version of the TGH logic model found in this report incorporates this feedback from TGH staff and includes additional discussions among our research team.