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# AN APPROACH TO DIGITAL EQUITY THAT LEVERAGES SOCIAL AND TECHNICAL CAPITAL: RECOMMENDATIONS FOR COMMUNITY ANCHOR INSTITUTIONS



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Despite the recent significant technological developments in the U.S. in resilient and pervasive digital infrastructure, many of our urban communities still experience complex issues of equitable access to digital services and information. Anchor institutions, such as schools, libraries, universities, and rec centers, play a vital role in equitable access to digital services and information. We argue that technology-rich programs that are community-led and supported by anchor institutions create environments in which youth and educators explore and gain confidence in computational thinking and STEM skills.



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Digital equity issues often go hand-in-hand with a lack of technology-rich training opportunities for youth and adults. This lack of training creates barriers to pathways to STEM careers and the economic mobility that these careers provide. The historical and persistent underinvestment in digital skills in low income communities has widened disparities in healthcare, education, transportation, housing, and employment. Furthermore, the shortage of skilled technology educators and trainers is an on-going challenge for creating scalable and ongoing learning programs in underserved communities.

For the past seven years, we have investigated multiple community-led approaches to addressing these issues in four collaborative NSF-funded research projects. In this report, we draw on our empirical findings and current academic and community efforts to present recommendations for responding to digital inequity issues in urban contexts. The recommendations for anchor institutions are listed here and fleshed out below with examples from the field.

## RECOMMENDATIONS

1. Empower Community Members to Lead Digital Navigation
2. Combine Technical Innovation with Local Knowledge and Infrastructure
3. Elevate Community Assets and Interests
4. Create Career Pathways that Combine Learning and Earning
5. Empower Communities to Connect with and Learn from Each Other

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## CONTEXT AND CURRENT FUNDING LANDSCAPE

Digital Equity Act, B.E.A.D., Digital Navigators. **The Digital Equity Act**, passed in 2021, which allocates \$2.75B in federal funding to address digital inequity and is complementary to the **B.E.A.D. Initiative**, is a \$42B initiative administered by the Dept of Commerce and National Telecommunications and Information Administration (NTIA) that funds the “planning, infrastructure deployment, mapping, and adoption programs” in all 50 states, Commonwealth of the Northern Mariana Islands.” **Digital Navigators** is a national program, administered by state broadband offices that trains educators, social workers, and volunteers to help local citizens increase access to: 1. High-speed internet; 2. Digital Devices; and 3. Digital Skills. Digital Navigators funding may also be aligned with programs that support employment opportunities for youth and adults. For example, many urban mayor’s offices host a Mayor’s Youth Employment Program (MYEP) that provides youth with meaningful career opportunities.

## WHY AND HOW TO INCLUDE NONPROFIT COMMUNITY INNOVATORS IN DIGITAL EQUITY INITIATIVES

The most culturally relevant and trusted sources of community programs come from people and nonprofits that are already known in communities. However, since these organizations are often grassroots and unconnected to larger infrastructure, they can be overlooked by large funding initiatives or not included in a meaningful way. When we include these nonprofit innovators, we leverage the knowledge, creativity, and social capital that is embedded in communities.

## THE UNIQUE POSITION OF ANCHOR INSTITUTIONS

Anchor institutions like schools, libraries, universities, and rec centers are found in every city. If we can connect trusted community and nonprofit leaders with anchor institutions while creating a supportive and flexible environment to lead, we can attain sustainable results.

Following are some examples of the roles that anchor institutions can play in supporting community-based Digital Navigators who are trained in co-design and deputized to serve as leaders to work with their communities, using arts, culture, and identity to teach digital skills:

- **A REC CENTER** employs Digital Navigators to host a community art project that uses technology to design and manufacture objects for an interactive art installation

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- **A LIBRARY** employs Digital Navigators to host a workshop in which participants use technology to make cheerful cards for elders in their community
  - **A HIGH SCHOOL** employs youth Digital Navigators to host a design challenge in which youth and educators use technology to create an app that promotes peer-to-peer learning



## COLLABORATIVE NSF RESEARCH PROJECTS

Through four research projects over the past seven years we have studied how nonprofit organizations promote digital skills. Below is a brief description of those research projects followed by practical recommendations that can be applied to the digital equity work at state and local levels.

- **Community Internet During COVID-19** - 2020-2022 (Award #: 2030451 & 2030490) was a collaborative project where local community internet provider, Project Waves, provided free access to broadband Internet connectivity to low-income households in Baltimore City during the COVID-19 pandemic and beyond with the goal of bridging the Digital Divide. Project Wave continues to create, advocate, and implement equitable solutions that connect the under-connected to digital Internet infrastructure and help individuals, families, and communities thrive.
- **Youth 3D Print Shop** - 2016-2021 (Award #: 1623490) was staffed with youth employees from the Digital Harbor Foundation's after-school program with expertise in 3D printing and responded to community requests for customized 3D printed objects, including assistive technologies and promotional materials. We used the 3D Print Shop as a Living Lab to study youth motivations, experiences, and perspectives. Our Rec Center Partners (see Rec-to-Tech U) have expressed interest in implementing this model.
- **Rec-to-Tech Pilot** - 2017-2020 (Award #: 1723610) In this project, we piloted and refined a holistic, scaffolded approach to providing long-term support for educators and organizations to integrate maker-based tech learning into their youth offerings, at three sites in Baltimore City and Washington, DC. Project outcomes included a comparison of three training and deployment methods to prepare educators to

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integrate youth-focused programming at their sites, and a set of best practices of scaling youth makerspaces and tech education programs, especially for underrepresented youth.

- **Rec-to-Tech U** - 2020-present (Award #: 2005502 & 2005484 ) is co-creating STEM experiences in Rec Centers in Pittsburgh and Baltimore with a focus on co-design and localization processes that help community leaders develop programs that fit their communities strengths and interests. Rec Centers live in the heart of the communities they serve and are tied to city government. This combination positions Rec Centers to be a vehicle for scalable, community-led impact.

## RECOMMENDATIONS AND EXAMPLES FROM THE FIELD

### **Recommendation 1: Empower Community Members to Lead Digital Navigation**

Our research with designing technology-rich learning experiences and providing equitable access to community Internet has shown that employing and training local community members in digital literacy and technical skills is an effective approach to giving community members the skills that they need and furthering digital equity. Investing in community members embedded in the communities they serve supports (1) trusting relationships, (2) relevant programming and services informed by community needs and interests, (3) emphasizing of community assets, and (4) sustainability through community buy-in.

**Illustrative Example from the Field:** In our **Community Internet During COVID-19** project, we found that recruiting, training, embedding local community members as community internet project staff (Project Waves), not only helped with understanding and addressing specific local challenges but was also instrumental to generating community buy-in and trust.

### **Recommendation 2: Combine Technical Innovation with Local Knowledge and Infrastructure**

Our research confirms that given the complexity of issues related to digital equity, it is necessary to consider and combine social and technical innovations in addressing them. New sociotechnical approaches require a holistic view that acknowledges the importance of context, infrastructure, and existing practices to meaningfully shape future innovations.

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**Illustrative Example from the Field:** In our **Rec-to-Tech U** project, we trained local community members in Baltimore City and Pittsburgh in a technology-rich curriculum that they delivered in youth afterschool programs at four Rec Centers . We found that educators draw on their lived experiences and knowledge of the social and cultural assets of the communities in their Rec Centers to engage youth over a sustained period of time and also create organizational buy-in more broadly.

**Recommendation 3: Elevate Community Assets and Interests**

Research, including ours, has overwhelmingly shown that valuing, elevating, and incorporating community assets and perspectives into technology design and deployment can result in outcomes that are relevant, effective, and sustainable. Historically, technology design and deployment strategies for underserved populations have focused on community needs rather than assets. By ignoring the strengths rooted in the community, strengths that can form the basis of resilient and authentic engagements, these approaches tend to result in “band-aid” solutions with limited impact. Recognizing and prioritizing community assets and perspectives will contribute to project buy-in, impact, and thus a sustainable promotion of digital equity.

**Illustrative Example from the Field:** In our **Rec-to-Tech U** project, we invited community educators to localize content of technology-rich learning experiences based on youth’s specific cultural and social traditions and practices. By showing that they saw value in specific cultural practices of youth, such as those reflected in urban fashion, music, and visual arts, educators were able to engage youth and the broader community more effectively.

**Recommendation 4: Create Career Pathways that Combine Learning and Earning**

Financial factors impact large populations of youth who would be otherwise participating in technology-rich learning experiences, training, and ultimately careers. Providing opportunities that combine meaningful learning experiences with monetary incentives for youth have the potential to not only remove barriers and increase participation but also to introduce and peak the interest of youth in long-term technical career paths.

**Illustrative Example from the Field:** In our **Youth 3D Print Shop Project**, we found that youth who participated in our afterschool technical professional training program, reported significant increases in technology interest and self-efficacy. Participants in two cohorts of paid youth employees showed increased gains in 3D printing, 3D modeling, and troubleshooting skills and advanced communication and coordination

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skills. Additionally, in the summer of 2022 we piloted a cohort of Youth Employees from the Mayor's Youth Employment Program (MYEP) to train and work as Tech Coaches in our Tech Center STEM Programs.

**Recommendation 5: Empower Communities to Connect with and Learn from Each Other**

In our work with multiple partners, stakeholders, and communities, time and again we are faced with questions of power, access, and structure, and how these are distributed and sustained over time. Many of our projects require careful consideration and continuous negotiation of balancing resources and responsibilities among partners and participants. These dynamics require time and effort to result in trust and capacity building and the meaningful development of community-driven initiatives. Something that helps build capacity and trust is connecting community members with communities in other cities. On the practical level, it helps to see how people solve problems from different perspectives and on the mission level, it helps community members connect to the digital Equity movement at the National level.

**Illustrative Example from the Field:** Our **Rec-to-Tech U** has provided multiple rec-centers with technical infrastructure, curriculum, training, and continuous support networks, helping them set up and localize their own technology-rich after-school learning programs for youth. We have found that connecting leaders across cities provides both cities with multiple forms of support, support in material and expertise as well as in the knowledge of how these should be used effectively and localized to reflect the specific characteristics of their respective contexts and communities.



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## CONCLUSION

In conclusion, this paper highlights the persistent challenges of digital inequity in urban communities in the U.S., despite significant technological advancements. The role of anchor institutions, such as schools, libraries, universities, and rec centers, has emerged as crucial in addressing these issues and promoting equitable access to digital services and information.

Community-led, technology-rich programs supported by anchor institutions can create environments that empower youth and educators to explore computational thinking and STEM skills. The lack of technology-rich training opportunities for youth and adults has exacerbated digital equity issues, hindering pathways to STEM careers and economic mobility in low-income communities.

By incorporating the recommendations in this report and leveraging the unique position of anchor institutions, we can work towards bridging the digital divide and fostering a more inclusive and equitable digital landscape for urban communities across the nation. It is evident that community-led efforts, supported by anchor institutions and informed by research, are essential in creating lasting solutions to address digital inequity.

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## HOW TO CITE

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## FURTHER RESOURCES AND INFORMATION:

[Designing Participatory Futures Lab](#) @ University of Maryland Baltimore County

Tech Lab Group + Community Internet Group @ [Digital Harbor Foundation](#)

