OFFICE OF
Educational Technology

Advancing Digital Equity for All:

Community-Based Recommendations for Developing Effective Digital Equity Plans to Close the Digital Divide and Enable Technology-Empowered Learning

September 2022

US DEPARTMENT OF EDUCATION
http://tech.ed.gov

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Advancing Digital Equity for All: Community-Based Recommendations for Developing Effective Digital Equity Plans to Close the Digital Divide and Enable Technology-Empowered Learning

U.S. Department of Education
Miguel A. Cardona, Ed.D.
Secretary

Office of Planning, Evaluation, and Policy Development
Roberto J. Rodríguez
Assistant Secretary

September 2022

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Foreword:

A Collective Vision for Advancing Digital Equity for Learners, Families/Caregivers, and Communities

The pandemic illuminated significant, long-standing educational equity gaps faced by many of our learners and spurred an unprecedented period of emergency remote learning.[1] One of the most critical challenges has been providing the foundational access to reliable, high-speed internet and adequate devices necessary to facilitate everywhere, all-the-time learning. Stories and data from the last two years clearly show the lack of this essential technology currently impacts communities of color and low-income communities to a disproportionate extent.[2]

Due to the incredible leadership of educators and education leaders and ongoing contributions of community-based organizations and institutions from across many sectors, some progress has been made in providing learners, families/caregivers, and communities with access to the internet. Through efforts like rapid device and hotspot procurement and distribution, assistance to qualifying households in signing up for the Federal Communication Commission's Affordable Connectivity Program, school-based technical support help desks, and digital literacy training, learning was able to continue in times when physical school buildings were closed.

As we recover from the pandemic, educators are increasingly leveraging the breadth of active and innovative learning opportunities made possible through technology.[3] In addition, schools are accelerating the implementation of whole learner approaches with technology, including connections to social and emotional supports, parent-educator engagement opportunities, tele-health and tele-mental health, and basic needs services. For such opportunities to become equitably and sustainably available at scale, we must do more to ensure all learners, families/caregivers, and communities have access to technology and the opportunities that it unlocks.

As other federal agencies work to make internet access more available and affordable across the nation, the U.S. Department of Education calls on state and local leaders to also bridge existing adoption barriers–providing learners, families/caregivers, and communities with the information, continuous support, and skill-building opportunities necessary to obtain regular, adequate access to reliable, high-speed internet service and technology tools for learning. Throughout this resource, the Office of Educational Technology has aggregated and synthesized critical, strategic action steps for leaders in addressing those human-level barriers, focusing on communities that are furthest from digital opportunities.

Our nation has quickly understood that digital equity is no longer a "nice-to-have" condition but a "must-have" to ensure that all may fully participate in the digital economy and society of today and tomorrow. We hope that this resource can serve as an informative guide as state and local leaders work to build, maintain, and implement their digital equity plans in partnership with learners, families/caregivers, and communities.

Roberto J. Rodríguez
Assistant Secretary
Office of Planning, Evaluation, and Policy Development
U.S. Department of Education

Kristina Ishmael
Deputy Director
Office of Educational Technology
U.S. Department of Education

[1] Stelitano, Laura, Sy Doan, Ashley Woo, Melissa Kay Diliberti, Julia H. Kaufman, & Daniella Henry. (2020). *The Digital Divide and COVID-19: Teachers' Perceptions of Inequities in Students' Internet Access and Participation in Remote Learning.* Santa Monica, CA: RAND Corporation. https://www.rand.org/pubs/research_reports/RRA134-3.html.

[2] Auxier, B., & Anderson, M. (2020, July 27). *As schools close due to the coronavirus, some U.S. students face a digital 'homework gap'.* Pew Research Center. Retrieved July 20, 2022, from https://www.pewresearch.org/fact-tank/2020/03/16/as-schools-close-due-to-the-coronavirus-some-u-s-students-face-a-digital-homework-gap/

[3] Sparks, S.D. & Harwin, A. (2022, March 22). *The teaching strategies educators say will outlast the pandemic.* Education Week. https://www.edweek.org/leadership/the-teaching-strategies-educators-say-will-outlast-the-pandemic/2022/03

Executive Summary

Digital equity is achieved when all individuals and communities have the information technology capacity that is needed for full participation in the society and economy of the United States (U.S.). Reaching this goal for all learners is a challenge that has been highlighted and exacerbated by the digital opportunity and equity gaps exposed due to the COVID-19 pandemic. The federal government, states and territories, localities, Tribes, nonprofit and community-based organizations, community anchor institutions, districts, schools, institutions of higher education, and many others have each contributed to the ongoing progress toward digital equity. By the spring of 2021, 94 percent of adults with children under 18 in their household reported having internet and computers always or usually available for learning, an increase from the spring of 2020.[4]

Despite significant growth in technology use, much work remains to ensure all learners, families/caregivers, and communities have access to reliable, high-speed broadband and technology tools for learning. In the U.S., more than 18 million households continue to face challenges with gaining access to high-speed broadband, and households earning less than $30,000 per year are significantly less likely to have a computer than households making over $100,000.[5] While 40 percent of K-12 learners identify as Black, Hispanic, or Native American, a disproportionately greater percentage of unconnected learners (54 percent) identify as Black, Hispanic, or Native American. Furthermore, Black and Hispanic learners are less likely to have a computer at home compared to white peers.[6] Overall an estimated 15–16 million K-12 learners do not have sufficient access to reliable, high-speed broadband and/or technology tools for learning.[7]

To ensure all learners have equitable access to reliable, high-speed broadband and technology tools for learning, we must consider the three components of access—availability, affordability, and adoption. While availability and affordability are often the focus of discussions around digital equity, adoption barriers—including, but not limited to, the lack of information, support, and skills necessary to obtain regular, adequate access to reliable, high-speed broadband and technology tools—currently impact 6 million learners.[8] Additionally, 32 million Americans have limited or no digital literacy skills, including half of Black and Hispanic workers.[9] While leaders should certainly address availability and affordability challenges as they advance digital equity, they must simultaneously put forth solutions to overcome human-level adoption barriers that currently reinforce the digital divide.

The U.S. Department of Education's Office of Educational Technology (OET) is well-positioned to support efforts to advance digital equity, particularly with regard to human-level adoption barriers. In developing this guidance resource, OET leveraged its experience in setting the national vision for the effective use of technology for learning, strong relationships with educators and education ecosystems, and commitment

[4] Hemphill, C., Wang, Y., Forster, D., Scott, C., & Wilburn, G. (2021, June 9). *Students' access to the internet and digital devices at home.* National Center for Education Statistics Blog. https://nces.ed.gov/blogs/nces/post/students-access-to-the-internet-and-digital-devices-at-home

[5] DigitalUS Coalition. (2020). *Building a digitally resilient workforce: Creating on-ramps to opportunity*. https://digitalus.org/wp-content/uploads/2020/06/DigitalUS-Report-pages-20200602.pdf

[6] Rideout, V.J. & Robb, M.B. (2021). *The Common Sense Census presents: Research brief. Remote learning and digital equity during the pandemic.* San Francisco, CA: Common Sense. https://www.commonsensemedia.org/sites/default/files/featured-content/files/final_release_digital_equity_research_brief_fact_sheet.pdf

[7,8] Ali, T., Chandra, S., Cherukumilli, S., Fazlullah, A., Galicia, E., Hill, H., McAlpine, N., McBride, L., Vaduganathan, N., Weiss, D., & Wu, M. (2021). Looking back, looking forward: What it will take to permanently close the K-12 digital divide. San Francisco, CA: Common Sense Media. https://www.commonsensemedia.org/sites/default/files/featured-content/files/final_-_what_it_will_take_to_permanently_close_the_k-12_digital_divide_vfeb3.pdf

[9] DigitalUS Coalition, 2020

to co-creating solutions with communities to drive national dialogue on the adoption of reliable, high-speed broadband and technology for learning. This guidance resource helps catalyze collective action to remove barriers for learners, families/caregivers, and communities, creating more equitable access to technology-enabled learning experiences for learners in both in-school and out-of-school learning environments and further enabling access and adoption among their families/caregivers and communities. When learners and their broader ecosystem are connected, they are also better able to access vital online services, such as tele-health, counseling, social services, remote employment opportunities, and job training.

The Infrastructure Investment and Jobs Act provides leaders with a historic opportunity to develop strategic plans to use the various recently authorized broadband funds. The purpose of this guidance resource is to support leaders in developing effective digital equity plans in these ways:

- Exploring the three components of access—availability, affordability, adoption
- Highlighting existing barriers to achieving digital equity
- Providing promising strategies to overcome these barriers
- Identifying key action steps for leaders

This guidance resource was informed by conversations with community leaders and members who participated in a series of listening sessions hosted through OET's Digital Equity Education Roundtable Initiative. These sessions provided valuable insights into the opportunities and challenges related to digital equity across different communities. These learnings may inform decision making for leaders in their path to achieving digital equity.

While each community will need to design and implement strategies that are aligned to their unique circumstances, several common themes were identified, which provide a foundational understanding for leaders and communities as they work together to co-develop strategies to advance digital equity.

	Availability	Affordability	Adoption
Barriers	• Lack of continuous internet and device availability for highly mobile learners • Lack of large-scale infrastructure due to digital redlining • Lack of reliable, high-speed broadband connection • Limitations of building-level infrastructure • Limited or lack of ownership of personal devices capable of running learning programs	• High cost of broadband and technology tools for learning • Lack of sustained funding for affordable internet programs	• Distrust between communities and government and/or private companies • Lack of access to technical support for learners and families/caregivers • Lack of collaboration between government agencies, community-based organizations, Tribes, and private companies • Lack of community buy-in due to the exclusion of communities most impacted by the digital divide from conversations about digital equity • Lack of inclusive strategies for communicating with families/caregivers • Lack of reliable, disaggregated data to guide investments in targeted communications and supports • Lack of resources and support in learners' and families'/caregivers' home languages • Lack of support to complete applications for affordable broadband programs • Limited access to digital literacy skills training for caregivers/families, learners, and educators • Limited access to professional learning for educators • Limited institution- and organization-level capacity
Strategies	• Distribution of hotspots and devices to learners and educators • Partnerships with internet service providers (ISPs) to increase equitable infrastructure • Use of public spaces and community partnerships to establish internet access	• Community partnerships with ISPs to lower costs • Ongoing federal, state or territory, and local funding for districts to purchase equipment and fund affordable internet and digital literacy programs • Programs offering subsidies to learners and families/caregivers	• Co-creation of solutions with community members and community-based organizations • Digital literacy opportunities for learners, families/caregivers, and educators • Multilingual technical support for learners and families/caregivers • Provision of human-level support through partnerships with community-based organizations and/or trusted advocates rooted in communities • Regular conversations soliciting feedback and needs from learners and families/caregivers

Key Steps for Leaders to Ensure Access for All Learners

OET further identified key steps leaders can take in their digital equity planning efforts to ensure access for all learners:

1. Develop and earn public trust through partnerships.
2. Learn from those impacted by inequitable access and provide opportunities for feedback.
3. Co-develop clear goals and strategies with communities to craft a comprehensive digital equity plan.
4. Raise public awareness and provide ongoing support for low- or no-cost broadband programs.
5. Provide digital literacy training and professional learning opportunities.

These steps are described further in the full report on page 51.

Please note that this guidance resource is NOT intended to provide guidance regarding the allowable uses of various broadband funds included in the Infrastructure Investment and Jobs Act. For information regarding allowable uses and other specific information about broadband programs in the legislation, please visit internetforall.gov.

Introduction

To fully participate in today's rapidly changing economy and society, all individuals need access to digital tools, devices, and skills training. However, communities across the country have long faced challenges to achieving digital equity. For example, 19 million households struggle to access reliable, high-speed broadband, especially in instances where multiple individuals are accessing broadband and devices concurrently.[10] In addition, although there are efforts to expand affordable access, limited awareness and availability of digital literacy development opportunities remain a barrier to adoption. Existing disparities in availability, affordability, and adoption of broadband and technology tools for learning have been highlighted and exacerbated by COVID-19 and other societal factors, as school, work, essential services, such as healthcare, and additional aspects of everyday life continue to move online at an accelerated pace. Therefore, the federal government, states and territories, localities, Tribes, nonprofit and community-based organizations, community anchor institutions, districts, schools, and institutions of higher education, and many others are contributing to the ongoing progress toward digital equity. Furthermore, through the 2022 Declaration for the Future of the Internet, the United States (U.S.) has committed to "promot[ing] affordable, inclusive, and reliable access to the internet for individuals and businesses where they need it and support efforts to close digital divides around the world to ensure all people of the world are able to benefit from the digital transformation." [11]

Adoption of Broadband[12] The process by which an individual obtains daily access to the internet—

- at a speed, quality, and capacity—
  - that is necessary for the individual to accomplish common tasks; and
- such that the access qualifies as an advanced telecommunications capability;
- with the digital skills that are necessary for the individual to participate online; and
- on a—
  - personal device; and
  - secure and convenient network.

Broadband:[13] "Broadband" is generally shorthand for quality internet service. Broadband provides high-speed internet access via multiple types of technologies, including fiber-optics, wireless, cable, DSL, and satellite.

Community Anchor Institution:[14] An entity such as a school, library, health clinic, health center, hospital or other medical provider, public safety entity, institution of higher education,

[10] American Libraries. (2022). *A Broad Look at Broadband* [Infographic]. AmericanLibraries.com. https://americanlibrariesmagazine.org/wp-content/uploads/2022/02/de-infographic.pdf

[11] U.S. Department of State. (n.d.). *Declaration for the future of the internet*. https://www.state.gov/declaration-for-the-future-of-the-internet

[12] Text - H.R.3684 - 117th Congress (2021–2022): Infrastructure Investment and Jobs Act. (2021, November 15). http://www.congress.gov/

[13] U.S. Department of Education, Office of Educational Technology. (2021a). *Glossary of Terms*. Keeping students connected and learning: Strategies for deploying school district wireless networks to connect students at home. https://tech.ed.gov/wireless-brief/glossary/

[14] National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce. (2022). *Notice of Funding Opportunity: Broadband Equity, Access, and Deployment Program*. https://broadbandusa.ntia.doc.gov/sites/default/files/2022-05/BEAD%20NOFO.pdf

public housing organization, or community support organization that facilitates greater use of broadband service by vulnerable populations, including, but not limited to, low-income individuals, unemployed individuals, children, the incarcerated, and aged individuals.

Community-Based Organization:[15] A private nonprofit organization of demonstrated effectiveness, Indian Tribe, or Tribally sanctioned educational authority, that is representative of a community or significant segments of a community and that provides educational or related services to individuals in the community.

Digital Equity:[16] The condition in which individuals and communities have the information technology capacity that is needed for full participation in the society and economy of the United States.

Digital Literacy:[17] The skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information.

High Speed Access:[18] Refers to access that is not less than 100 megabits per second for downloads nor 20 megabits per second for uploads and latency that is sufficient enough to support real-time, interactive applications.

Technology Tools for Learning: Devices, hardware, software, and technology-based services used in in-school and out-of-school contexts for learning.

The State of Digital Equity for Learners

Significant progress has been made to increase access to broadband and technology tools for learning. Recent analysis of COVID-relief spending plans indicate that leaders have prioritized access to broadband and technology tools to facilitate learners' learning in both in- and out-of-school settings.[19] Since 2020, the median cost per megabit for school internet access has decreased by 24.9 percent—from $1.85 to $1.39 per megabits per second (Mbps)[20] — and recent data from the 2020–21 National Teacher and Principal Survey reports 45 percent of public school principals have worked directly with internet service providers (ISPs) to help learners access the internet at home.[21] District implementation of 1:1 device programs have also notably increased from 2020 to 2022, from 66 percent to 83 percent for grades 9–12 and from 69 percent to 86 percent for grades 6–8.[22] In parallel, home internet access has increased substantially since 2015, notably among families with incomes below the poverty level, Black households, and families headed by immigrant Hispanic parents.[23] States, Tribes, and U.S. territories have recognized the need for broadband

[15] Text - H.R.1 - 107th Congress (2001–2002): No Child Left Behind Act of 2001. (2002, January 8). http://www.congress.gov/

[16, 17, 18] H.R.3684 - 117th Congress (2021–2022): Infrastructure Investment and Jobs Act, 2021

[19] Jordan, P.W. & DiMarco, B. (2022). *National, regional trends in educators' Covid-relief spending.* FutureEd. https://www.future-ed.org/national-reading-trends-covid-relief-spending/

[20] Connect K-12. (2021). *Report on school connectivity: Funding year 2021.* https://connectk12.org/static/media/Connect_K12_Connectivity_Report_2021_FINAL.6d154596.pdf

[21] Berger, M., Kuang, M., Jerry, L., & Freund, D. (2022). *Impact of the Coronavirus (COVID-19) Pandemic on Public and Private Elementary and Secondary Education in the United States: Results from the 2020–21 National Teacher and Principal Survey* (NCES 2022-019). U.S. Department of Education. Washington, D.C.: National Center for Education Statistics. Retrieved May 2, 2022, from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2022019.

[22] Consortium for School Network (CoSN). (2022). *EdTech Leadership Survey Report 2022.* https://www.cosn.org/edtech-topics/state-of-edtech-leadership/

[23] Katz, V. & Rideout, V. (2021). *Learning at home while under-connected: Lower-income families during the COVID-19 pandemic.* New America. https://www.newamerica.org/education-policy/reports/learning-at-home-while-underconnected/

affordability in addition to increasing device access and ownership. Utah, Washington, and California have been identified as exemplars for having innovative emerging practices in addressing affordability, access, and ownership in their state broadband plans.[24]

High quality broadband subscriptions predict a variety of positive economic outcomes, which include growth in prosperity (e.g., productivity, wages, and standard of living), median income, and employment opportunities.[25] Access to broadband can enable opportunities for families to participate fully in the digital economy, expanding education and career advancement opportunities. A recent study conducted by the Brookings Institution reveals that at the county level, median income increases over time with increases to broadband subscriptions.[26] This correlation between median income and broadband subscription predicts higher median household income in urban, suburban, and rural counties.[27] Digital skills further break down physical, social, and economic barriers by providing opportunities to individuals regardless of income, geography, or educational attainment to access information, services, gainful employment opportunities, and resources.[28] For example, Michigan created a High Speed Internet Office that provides direct 1:1 support in connecting constituents to health navigators.[29] Sitting Bull College, located on the Standing Rock Reservation, launched a digital navigator program that supports learners preparing for their GED online.[30] When addressing broadband access, it is imperative for leaders to consider widespread, inclusive adoption practices that stimulate greater social benefits for human capital and economic development than the availability of broadband alone.[31]

Bandwidth:[32] The rate at which the network can transmit information. Generally, higher bandwidth is desirable. The amount of bandwidth available to you can determine whether you download a photo in two seconds or two minutes.

Digital Navigator:[33] An individual who addresses the whole digital inclusion process—home connectivity, devices, and digital skills— with community members through repeated interactions.

While the increased access is promising, at least 18 million U.S. households still do not have access to any form of broadband due to a variety of reasons.[34] The median bandwidth for learners in schools nationally is just 1.25 megabits per second for each learner,[35] which may not be sufficient for more demanding activities.[36] Modern and quality broadband services are especially lacking in rural[37] and

[24] Microsoft, National Digital Inclusion Alliance, & National Skills Coalition. (n.d.). *State broadband plans indicator.* State digital equity scorecard. https://state-scorecard.digitalinclusion.org/scorecard/by_indicator

[25,26,27] Mossberger, K., Tolbert, C., & LaCombe, S. (2022, March 28). *Why digital human capital is important in community building.* Brookings TechTank. https://www.brookings.edu/blog/techtank/2022/03/28/why-digital-human-capital-is-important-in-community-building/

[28] EveryoneOn. (2022). *Digital skills and trust: How they affect the way low- and lower-middle income households connected to the internet during the pandemic.* https://static1.squarespace.com/static/5aa8af1fc3c16a54bcbb0415/t/61fc71248a56247e899c2a20/1643933997111/EveryoneOn_Report_2_DigitalSkills_and_Trust.pdf

[29,30] The Newdeal Forum Broadband Task Force. (2022). *Bridging the digital divide: Policy proposals to increase broadband access for all.* https://s3.documentcloud.org/documents/21203370/bridging-the-digital-divide-020922.pdf

[31] Mossberger et al., 2022

[32] U.S. Department of Education, Office of Educational Technology, 2021a

[33] National Digital Inclusion Alliance. (n.d.). *The Digital Navigator Model.* https://www.digitalinclusion.org/digital-navigator-model/

[34] Federal Communications Commission. (2020). *2020 broadband deployment report.* https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2020-broadband-deployment-report

[35] Connect K-12, 2021

[36] Federal Communications Commission. (2022). *Consumer guide: Broadband speed guide.* https://www.fcc.gov/sites/default/files/broadband_speed_guide.pdf

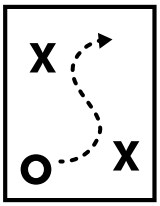
[37] Communications Workers of American & National Digital Inclusion Alliance. (2020). *AT&T's digital redlining leaving communities behind for profit.* https://www.digitalinclusion.org/wp-content/uploads/dlm_uploads/2020/10/ATTs-Digital-Redlining-Leaving-Communities-Behind-for-Profit.pdf

Tribal communities.[38] Further, urban communities continue to face infrastructure challenges with old buildings unequipped to support broadband access, as well as physical structures that block transmission, commonly referred to as internet "dead zones."[39] The Federal Communications Commission (FCC) recognizes its current approach to capturing broadband availability has led to inaccurate mapping and is therefore working toward updating its data collection and reporting processes.[40]

Recent analysis also indicates that the U.S. has the highest monthly internet cost compared to other North American, European, and Asian regions—average monthly plans cost $35.53 for DSL, $66.31 for cable, and $79.92 for fiber.[41] Thirty-two percent of U.S. households are subscription vulnerable, meaning they are unable to afford and maintain services.[42] This gap leads to differences in learning experiences, as 65 percent of families with income levels below the poverty threshold reported lack of access prevented their children from participating in school and completing schoolwork or that their child had no option other than to participate through a mobile device.[43] Among families with income levels below the national median and with access to broadband, 56 percent stated the service was too slow, and among families with home access to a computer, 59 percent stated their device runs too slowly or does not work.[44] Sixty-five percent of families with incomes below the national poverty level, 66 percent of Hispanic parents, 75 percent of families headed by immigrant Hispanic parents, and 56 percent of Black parents with incomes below the national median reported technology-related disruptions to their children's learning.[45] Such figures may also be higher in reality due to underreporting. For example, Spanish-language-dominant Americans are less likely to report having high-speed internet at home.[46]

32 percent

of U.S. households are subscription vulnerable, meaning they are unable to afford and maintain services.[42]



6 million

K-12 students face adoption barriers outside of availability and affordability.[50]

9 million

of 37 million households that are eligible for the Emergency Broadband Benefit (EBB) program applied.[71]

[38] United States Government Accountability Office. (2018). *Tribal broadband: FCC's data overstate access, and tribes face barriers accessing funding.* https://www.gao.gov/products/gao-19-134t

[39] Workie, E., Hinkle, L., deDufour, A., & Lacarte, V. (2022). *Advancing digital equity among immigrant-origin youth.* Migrant Policy Institute. https://www.migrationpolicy.org/sites/default/files/publications/mpi-digital-equity-2021_final.pdf

[40] Federal Communications Commission. (2021). *Rosenworcel statement: FCC takes next step to collect more precise broadband mapping data.* https://www.fcc.gov/document/fcc-takes-next-step-collect-more-precise-broadband-mapping-data/rosenworcel-statement

[41] National League of Cities. (2021). *Conversations with Municipal Leaders: Digital Equity in Cities.* https://nlc.org/wp-content/uploads/2021/12/Digital-Advancement-in-Cities-comp_V3.pdf

[42] Horrigan, J.B. (2022, April 5). *Three data points to help plan for infrastructure investment and jobs act broadband funding.* Benton Institute for Broadband and Society Digital Beat. https://www.benton.org/blog/three-data-points-help-plan-infrastructure-investment-and-jobs-act-broadband-funding

[43, 44, 45] Katz & Rideout, 2021

[46] Johnson, M., Bashay, M., Bergson-Shilcock, A., Richardson, M., & DeRenzis, B. (2019). *The roadmap for racial equity.* National Skills Coalition. https://nationalskillscoalition.org/resource/publications/the-roadmap-for-racial-equity/

The quality and type of home broadband access has shown to directly impact learner school participation,[47] performance outcomes, and digital literacy.[48] Learners with insufficient access are also less likely to plan for postsecondary education, impacting their lifetime potential for high earnings.[49]

Of the estimated 15–16 million K-12 learners who have insufficient broadband access or access to devices to support learning at home, approximately 6 million face adoption barriers apart from availability and affordability.[50] For example, learners who have immigrated to the U.S. and learners from multilingual homes face unique challenges in getting connected and engaging with learning once connected. Credit checks or deposits to get a subscription and digital literacy gaps further inhibit receiving low-cost coverage.[51] Children with disabilities, who disproportionately live in low-income households, experience additional technology barriers, such as outdated equipment, inaccessible online platforms and course materials, and a lack of in-person support to engage with technology tools for learning.[52] Most school districts saw less than 10 percent of unconnected households enroll in free broadband programs, such as the Emergency Broadband Benefit (EBB) and Affordable Connectivity Program (ACP).[53]

Even with high technology usage in the classroom,[54] few professional learning opportunities for effective technology use in instruction are provided to educators. The National Center for Education Statistics has found that on average, educators working with low-income and rural learners are the least likely to receive access to training on effective technology use in instruction.[55] Combined, these barriers further contribute to the digital divide.

Unconnected: Learners and families not having access to devices and internet service.

For learners in postsecondary or adult education programs, similar barriers exist. More than half of adult learners (54 percent) reported having to make purchases to participate in online learning. Further, 91 percent of adult learners who are also caregivers responded that these purchases were costly,[56] and 44 percent of learners reported that internet connectivity problems interfered with their ability to attend or participate in courses at least occasionally.[57] Internet connectivity problems were reported more often by Hispanic and Black adult learners than by non-Hispanic white adult learners.[58] Of those learners who do have internet access, 54 percent of learners (72 percent of learners who are caregivers) reported that the internet was a significant cost.[59] Further, 16 percent of adult learners reported sharing their device with others in their household,[60] and 38 percent of learners reported primarily completing coursework on a smartphone.[61]

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[47] Katz & Rideout, 2021

[48, 49] Hampton, K.N., Fernandez, L., Robertson, C.T., & Bauer, J.M. (2020). *Broadband and Student Performance Gaps.* James H. and Mary B. Quello Center, Michigan State University. https://doi.org/10.25335/BZGY-3V91

[50, 51] Ali et al., 2021

[52] National Council on Disability. (2021). *The impact of COVID-19 on people with disabilities.* https://ncd.gov/sites/default/files/NCD_COVID-19_Progress_Report_508.pdf

[53] Education Superhighway. (2021). *No home left offline: Bridging the broadband affordability gap.* https://www.educationsuperhighway.org/wp-content/uploads/No-Home-Left-Offline-Report_EducationSuperHighway2021.pdf

[54, 55] Gray, C., & Lewis, L. (2021). *Use of Educational Technology for Instruction in Public Schools: 2019–20 (NCES 2021-017).* U.S. Department of Education. Washington, D.C.: National Center for Education Statistics. https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2021017

[56] Hiler, T., Fishman, R., & Nguyen, S. (2021, January 21). *One semester later: How prospective and current college students' perspectives of higher ed have changed between August and December 2020.* Third Way. https://www.thirdway.org/memo/one-semester-later-how-prospective-and-current-college-students-perspectives-of-higher-ed-have-changed-between-august-and-december-2020

[57, 58] Means, B., and Neisler, J., with Langer Research Associates. (2020). *Suddenly Online: A National Survey of Undergraduates During the COVID-19 Pandemic.* San Mateo, CA: Digital Promise. https://digitalpromise.dspacedirect.org/handle/20.500.12265/98

[59, 60] Hiler, Fishman, & Nguyen, 2021

[61] Clark, A. (2020, May 31). *Survey reveals higher ed students have inequitable access to reliable broadband.* Higher Learning Advocates. https://medium.com/higher-learning-advocates/survey-reveals-higher-ed-students-have-inequitable-access-to-reliable-broadband-ab3cc152d663

Disparate access not only has an impact on learning, but consequently on the economic security and opportunities of learners, educators, families/caregivers, and their communities.[62] Adult learners with limited English fluency were inhibited from accessing online upskilling opportunities during the pandemic due to language barriers.[63] Parents earning lower wages and/or with less formal education are more likely to rely on their children for technology help,[64] and data show that lack of high-speed internet is disproportionately common in low-income, rural, and Tribal communities.[65] Under-connected communities are barred from engaging in the workforce, participating in tele-medicine, engaging in schoolwork, and maintaining social connections.[66] Adult learners reported not having familiarity with online learning technologies and being unable to access essential services such as support services and instructors.[67] With over 32 million adults lacking basic digital literacy skills, coupled with the accelerated transition to a digital society and economy, ubiquitous access to high-quality broadband and resources for digital skills training and support are essential.[68]

Under-connected:[69] Learners and families whose access to devices and internet service is unreliable or insufficient to fully participate in society.

In response to the COVID-19 pandemic, the FCC deployed the $3.2 billion EBB program to support home broadband access and help learners and families/caregivers access jobs, healthcare, and education by providing subsidized monthly broadband services and discounts on buying a device.[70] In December 2021, only 9 million households, including 139,000 households on Tribal lands, had enrolled out of the 37 million eligible.[71] Recent research indicates that only a quarter of low- and middle-income households are even aware of free or discounted broadband offers.[72] FCC Chairwoman Jessica Rosenworcel has recognized that investment in community-based organizations would have improved the success of the EBB program, now expanded to the ACP.[73] As trusted partners and messengers, nonprofit and local organizations have proactively been working at the grassroots level to provide in-person assistance for enrollment in eligible federal programs.[74] However, such awareness-building and inclusive adoption efforts necessitates focused support from leaders that match the level of work required from community-based organizations.[75]

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[62] Education Superhighway, 2021

[63] Bergson-Shilcock, A. (2020). *Amplifying impact: How policies that combine investment in English language skills with digital learning pay off for workers and businesses.* National Skills Coalition. https://nationalskillscoalition.org/wp-content/uploads/2020/12/06-25-2020-NSC-Amplifying-Impact.pdf

[64] Katz & Rideout, 2021

[65] U.S. Department of Education, Office of Educational Technology. (2021b). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks to Connect Students at Home.* https://tech.ed.gov/files/2021/06/20210618-WirelessBrief.pdf

[66] American Libraries, 2022

[67] Soria, K. M., Chirikov, I., & Jones-White, D. (2020). *The obstacles to remote learning for undergraduate, graduate, and professional students.* SERU Consortium, University of California - Berkeley and University of Minnesota. https://cshe.berkeley.edu/seru-covid-survey-reports

[68] The Newdeal Forum Broadband Task Force, 2022

[69] Katz & Rideout, 2021

[70] Federal Communications Commission. (2022, May 9). *Emergency Broadband Benefit.* https://www.fcc.gov/broadbandbenefit

[71] Universal Service Administrative Co. (n.d.). *Emergency Broadband Benefit program enrollments and claims tracker.* Emergency Broadband Benefit Program. https://www.usac.org/about/emergency-broadband-benefit-program/emergency-broadband-benefit-program-enrollments-and-claims-tracker/

[72] EveryoneOn. (2021). *Affordability and the digital divide.* https://static1.squarespace.com/static/5aa8af1fc3c16a54bcbb0415/t/61ad7722de56262d89e76c94/1638758180025/EveryoneOn+Report+on+Affordability+%26+the+Digital+Divide+2021.pdf

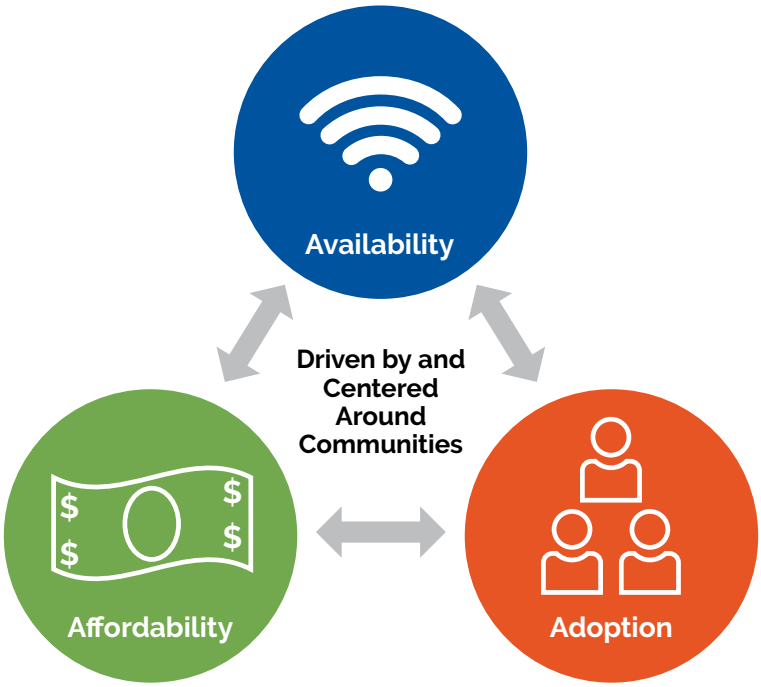
[73] Curi, M. (2021, September 23). *Broadband subsidy program sign-ups lag amid lack of outreach funds.* Bloomberg Law. https://news.bloomberglaw.com/tech-and-telecom-law/broadband-subsidy-program-sign-ups-lag-amid-lack-of-outreach-funds

[74] Curi, 2021

[75] EveryoneOn, 2021

The Role of the U.S. Department of Education in Advancing Digital Equity

As demonstrated by the current state of digital equity, access to reliable, high-speed broadband and technology tools for learning is a multifaceted challenge. The broader challenge of access can be viewed through three distinct, although not mutually exclusive, components—**availability, affordability, and adoption**. To advance digital equity, all three components must be addressed individually and in connection with one another. Learners, families/caregivers, and their communities need to have high-speed broadband service and technology tools for learning ubiquitously **available** to them, that service and those devices need to be **affordable** long-term, and information, technical support, and skill development opportunities must be accessible to ensure **adoption**. Building the necessary physical infrastructure alone, although a critical step, will not resolve the unique challenges faced by learners, families/caregivers, and communities. Leaders must, in parallel, ensure access is sustainably affordable and provide adoption support.



In developing this guidance resource, OET leveraged its experience in setting the national vision for the effective use of technology for learning, strong relationships with educators and education ecosystems, and commitment to co-creating solutions with communities to drive the national dialogue on the adoption of reliable, high-speed broadband and technology for learning and catalyze collective action to remove barriers for learners, families/caregivers, and communities. OET envisions a future in which every learner has the information, support, and skills to equitably access affordable, reliable, high-speed broadband service, adequate internet-enabled devices, digital literacy skills training, quality technical support, and applications and online content designed to facilitate self-sufficiency, participation, and collaboration. When learners and their broader ecosystem are connected, they are able to access vital online services, such as tele-health, counseling, social services, remote employment opportunities, job training, and more.

The Three Components of Access—Availability, Affordability, Adoption

Availability: Is there sufficient infrastructure and coverage to deliver reliable, high-speed wired or wireless broadband service and technology tools for learning?

Affordability: Can learners and families/caregivers pay for the total cost of maintaining reliable, high-speed broadband service and technology tools for learning?

Adoption: Do learners and families/caregivers have the information, support, and skills to obtain regular, adequate access to reliable, high-speed broadband service and technology tools for learning?

The Digital Equity Education Roundtables Initiative

OET developed the Digital Equity Education Roundtables (DEER) initiative to advance digital equity. The DEER initiative seeks to close the digital divide and enable all learners in PK-12, higher education, and adult education to unlock technology-enabled opportunities for learning and fully participate in a digital society. Through the DEER Initiative, OET hosted a series of national conversations (listening sessions) with leaders from community-based organizations as well as families and learners furthest from digital equity to learn more about the barriers faced by learner communities and promising solutions for increasing access to technology for learning. Based on these conversations, OET shares the following guidance on equitable broadband access, with particular emphasis on adoption, to support leaders in building their digital equity plans.

Opportunities in the Infrastructure Investment and Jobs Act

This guidance resource is designed to help leaders build effective digital equity plans, with particular attention to access barriers faced by learners. This guidance resource is NOT intended to provide guidance regarding the allowable uses of various funds included in the Infrastructure Investment and Jobs Act or other broadband-related federal funds. For information regarding allowable uses and other specific details about broadband programs in this legislation, such as the Broadband Equity, Access, and Deployment (BEAD) Program and Digital Equity Act, please visit https://www.internetforall.gov/. For information about other broadband-related federal funds, please visit https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding.

Barriers and Strategies

In a series of listening sessions to explore community-based solutions to digital equity, participants discussed the lack of access to reliable, high-speed broadband and technology tools for learning and its impact on learners, particularly those who need the most support and experience marginalization. These conversations considered the perspectives of those leading work to support learners of color, Native and Indigenous learners, learners from rural areas, learners from urban areas, and adult learners and higher education learners. Participants agreed that coordinated efforts to close the digital divide could help increase learner engagement and participation in everywhere, all-the-time learning.

This section presents specific barriers highlighted during the listening sessions, as well as strategies to advance digital equity in three key components of access—**availability, affordability, and adoption**. Several common themes were identified, offering guidance for leaders and communities as they work together to co-design and implement strategies to promote digital equity grounded in the needs and aspirations in their communities. These themes are further illustrated in a series of short case studies and listening session participant quotes. Addressing all three components of access simultaneously through a set of interconnected strategies is essential to achieving digital equity and overcoming the systemic, structural, and human-level barriers impeding equitable access.

Availability:
Is There Sufficient Infrastructure and Coverage to Deliver Reliable, High-Speed Wired or Wireless Broadband Service and Technology Tools for Learning?

Availability refers to the level and sufficiency of coverage in delivering high-speed, reliable wired or wireless broadband services and sufficiency of technology tools for learning. Barriers and strategies related to availability align with typical understandings of "access," focused on whether learners and their families/caregivers can connect to reliable, high-speed broadband through a device and the necessary physical infrastructure from home and in their communities.

Availability Barriers Within Communities

Lack of Reliable, High-Speed Broadband Connection

Participants discussed learners not having reliable, high-speed broadband available at home. Participants emphasized that when the connection is not reliable or does not perform at high enough speeds, using a variety of software for learning becomes difficult (e.g., simultaneously running a video conferencing application with the video on alongside learning applications), and multiple learners cannot use the broadband at the same time. Participants also discussed educators—including classroom teachers, support staff, pre-service educators, faculty, and adjunct faculty—not having reliable, high-speed broadband available. This was especially apparent when the educators' instructional use from home coincided with their own child(ren)'s engagement with online learning. Participants also described challenges of mobile-only access (e.g., working on a cellular phone, using a phone as a hotspot, or using a designated hotspot device), including insufficient stability, speed, and data caps. For example, one analysis

finds that broadband users consume on average, several hundred gigabytes of data every month, which can be costly (see next section on affordability barriers).[76]

Hotspots:[77] Wi-Fi Hotspots are physical locations, such as an airport or coffee shop, where people can wirelessly connect their device(s) to the internet using Wi-Fi via a wireless local area network (WLAN). A mobile or portable hotspot uses a cellular data connection, such as through a smartphone, to connect or "tether" their device(s) to the internet.

Based on their experiences, participants believed that leaders often worked under the assumption that all families/caregivers have broadband. Such assumptions are especially damaging for those who live in poverty, learners living in rural areas, and learners who live in digitally redlined urban areas. As learners return to physical school buildings, many participants noted that some schools and districts have stopped supporting at-home internet access. This leaves many learners unable to fully engage in educators' continued use of technology-enabled instructional methods, including for homework or on inclement weather days. Availability is also a barrier for out-of-school learning, such as online summer learning and tutoring opportunities. Finally, not having home broadband is a barrier for families/caregivers when they need to connect to school meetings and family/caregiver-educator conferences virtually.

> *I think that post-pandemic, the kids have gotten very comfortable with their technology...the teachers too, just being able to use [digital learning opportunities] as a part of their lesson. And so that's the bright spot from it. But it didn't change whether [students] would have continued [access]...versus knowing that they have access at school...I think that the teachers are even more comfortable [integrating digital learning], but sometimes are forgetting that kids may not necessarily still have access to [broadband and technology tools for learning]... And so, we're moving on as if it's completely done. It's still a work in progress, but [some are] continuing to make the assumption that everybody has that access.*
>
> —Reflection from roundtable focused on learners of color

The lack of reliable, high-speed broadband connection is especially detrimental for justice-involved learners (learners who have interacted with the criminal justice system or who were incarcerated and are reintegrating into their communities), learners who are immigrants or refugees, and learners who have disabilities. Participants shared that justice-involved learners have limited connectivity and availability of devices due to cost, policy constraints, and security concerns. Participants also emphasized that many prisons are in rural or remote areas, creating geographic barriers to broadband availability. Justice-involved learners who are not supported with broadband and/or device access cannot access resources and information necessary to aid their reentry into the workforce and communities, which may impact recidivism rates. When learners who are refugees arrive in the U.S., participants highlighted that they do not always have the resources or support to set up reliable, high-speed broadband connections quickly. This limits their ability to fully engage in learning opportunities, including language development.

[76] Baumgartner, Jeff. (2022). Average data consumption eclipses half a terabyte per month – OpenVault. Light Reading. https://www.lightreading.com/cable-tech/average-data-consumption-eclipses-half-terabyte-per-month---openvault/d/d-id/775689

[77] U.S. Department of Education, Office of Educational Technology, 2021a

Digital Redlining:[78] The practice of creating and perpetuating inequities between already marginalized groups specifically through the use of digital technologies, digital content, and the internet. For example, ISPs invest in building fiber infrastructure in wealthier neighborhoods while under-investing in the broadband infrastructure in low-income communities, resulting in low-income broadband users with more expensive, slower access.

Fiber-optic:[79] A system that uses glass (or plastic) to carry light, which is used to transmit information. Typically, each side of the fiber is attached to a laser that sends the light signals. When the connection reaches capacity, the lasers may be upgraded to send much more information along the same strand of fiber. This technology has been used for decades and will remain the dominant method of transmitting information for the foreseeable future.

Limited data and bandwidth can also pose particular barriers for learners with disabilities. For example, learners with dyslexia, blindness, cerebral palsy, and other reading barriers, who typically utilize online resources to read accessible books and supplemental educational materials at school, lose access to the digital books they depend on for learning without adequate data or bandwidth at home. Additional barriers exist for learners who are deaf or hard of hearing who need to simultaneously stream videos of virtual instruction alongside interpreters, requiring smooth, reliable video transmissions to understand the lesson and fully participate.

Limited or Lack of Ownership of Personal Devices Capable of Running Learning Programs

Participants discussed barriers related to learners' limited ownership of personal devices with the adequate specifications to run software for learning (e.g., video conferencing applications, internet browser with multiple tabs open simultaneously). Although the National Center for Education Statistics notes that over 80 percent of 4th and 8th graders have access to a device from home,[80] participants also discussed the need to replace older devices with those that meet adequate specifications. Additionally, some families/caregivers with multiple children only have access to a single device, inhibiting some children from engaging in digital learning opportunities while it is in use. Moreover, some described learners not having continued access to a device while theirs undergoes repair.

A personal device capable of running software for learning is especially important for learners who are currently or were formerly justice-involved, learners with disabilities, and learners with limited literacy skills. Justice-involved learners rarely have continued access to a device, and often those devices are not of sufficient quality to support learning. For learners with disabilities or with limited literacy skills, providing devices without assistive or adaptive technologies or those that are incapable of supporting assistive technologies inhibits them from equitably engaging with instructional materials in the most appropriate formats. Listening session participants additionally emphasized that individuals who are justice-involved experience higher levels of disabilities as compared to the general population.[81] This creates a pressing need for device accessibility for justice-involved individuals to access meaningful learning and skills development opportunities.

[78, 79] U.S. Department of Education, Office of Educational Technology, 2021a

[80] National Center for Education Statistics. (2021). *Students' access to the internet and digital devices at home.* https://nces.ed.gov/blogs/nces/post/students-access-to-the-internet-and-digital-devices-at-home

[81] Maruschak, L.M., Bronson, J., & Alper, M. (2021). *Disabilities reported by prisoners: Survey of prison inmates, 2016.* Bureau of Justice Statistics. https://bjs.ojp.gov/library/publications/disabilities-reported-prisoners-survey-prison-inmates-2016

In addition to challenges in making devices initially available to learners, schools and other community anchor institutions face barriers in funding maintenance, repair, upgrade, and replacement, as well as paying for the human resources necessary to lead such efforts (e.g., IT professionals, technical support personnel, customer service agents).

Lack of Continuous Internet and Device Availability for Highly Mobile Learners

Participants specifically highlighted how availability of broadband and devices substantially impacts highly mobile learners, such as migratory learners, learners in foster care, learners experiencing housing insecurity or homelessness, and justice-involved learners. Particularly when devices are provided by schools, districts, or other community anchor institutions, highly mobile learners lose access when they move to a new location and must return their devices. Additionally, each relocation requires a new installation of fixed connection or access to mobile connections.

Lack of Large-Scale Infrastructure Due to Digital Redlining

The Infrastructure Investment and Jobs Act specifically states that individuals "should benefit from equal access to broadband internet access service" and that such access should not be inhibited by "income level, race, ethnicity, color, religion, or national origin." Participants noted that digital redlining practices result in areas of low infrastructure investment, deepening the digital divide, especially for families/caregivers and learners of color, and preventing equal access. According to participants, providers currently do not have incentives to expand into unconnected regions, particularly because of limited potential for scale and profit. Many of the same areas also do not have cellular service or mobile connectivity. For learners living in these digitally redlined communities, accessing digital learning opportunities is challenging, and programs to make broadband more affordable have limited impact.

Rural areas, including those in Tribal lands and Native reservations, are especially impacted by digital redlining as they are more sparsely populated. Participants noted that Tribal lands and Native reservations have also historically been purposefully located in isolated and under-resourced areas and experience under-investment in infrastructure. The limited number of households who would gain availability from connectivity, coupled with high costs to build the necessary infrastructure, disincentivizes providers from serving these regions.

Participants identified digital redlining within cities as well. Within cities, participants noted that some buildings and homes may not be connected, even when physical infrastructure may be installed at the street level. Participants described instances where providers claimed areas were connected, when in reality, the necessary wiring had not been connected to homes and buildings. Tribal communities near cities face additional barriers due to the coordination required between Tribal governments, federal/state/local governments, and providers. Consequently, Tribal governments have been disproportionately burdened by the work required to keep their communities digitally connected without the necessary support or collaboration.

Participants also shared the impact of not having electricity on broadband availability, particularly within Tribal communities. Further, participants discussed the assumption by leaders and providers that learners and families/caregivers have access to electricity to power devices and broadband within their homes.

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[82] Luna, M. & Nicholas, D. (2022). An environmental justice analysis of distribution-level natural gas leaks in Massachusetts, USA. *Energy Policy*, 162. https://doi.org/10.1016/j.enpol.2022.112778

> *We're also tracking a lot of our efforts through racial equity data...disaggregating our data to...see who's most in need and ensuring that work lifting those communities...[W]hen we disaggregate data to be able to see who is disproportionately affected, we're able to see that our Black and Brown communities, our low-income communities, older adults, [and] youth are most disproportionately affected by [the] digital divide. So, we're making sure that we're prioritizing those communities first in our outreach and engagement efforts.*
>
> —Reflection from roundtable focused on learners from urban areas

Finally, when current infrastructure is not maintained and repaired, communities lose broadband access and learners are unable to engage with digital learning experiences, particularly after inclement-weather events and other natural disasters. This especially impacts communities of color and low-income communities, who are often the most vulnerable to natural disasters and the last to receive repairs.[82]

Limitations of Building-Level Infrastructure

Participants discussed limitations to infrastructure at the building level. For example, participants shared that learners and families/caregivers who rent from landlords often need permission to install wired connectivity options. Some community leaders explained that learners and families/caregivers in their communities were not comfortable asking for this permission, and some individuals who had asked were refused. In other instances, learners and families/caregivers live in buildings with particular rules or contracts with a single provider, preventing them from installing affordable broadband options. Further, many participants highlighted that some buildings are not able to accommodate Wi-Fi or install wired options because of the building age, design, or materials. Finally, participants discussed learners and families/caregivers living in locations such as basements, where their address may not be recognized as a separate household and, therefore, cannot be serviced by broadband.

Availability Strategies Leveraged by Communities

To address availability challenges during COVID-19, participants discussed distribution of take-home hotspots and devices to learners, families/caregivers, and educators from schools, districts, or higher education institutions. Mobile and satellite technologies also provided quick solutions to make internet connections available, particularly in rural areas. For learners and families/caregivers without hotspots, participants described the use of public commercial spaces, Wi-Fi-enabled buses, or school or library parking lots as interim solutions for connectivity. Similarly, in instances where devices were not available from home, learners relied on the library, stayed late at school, or used cell phones in order to complete assignments.

Case Study: Broadband Availability Data Collection and Mapping at Navajo Preparatory School

The Navajo Preparatory School (Navajo Prep) in New Mexico serves learners across the Navajo Nation, which is the size of West Virginia. The school enrolls approximately 270 students from more than 50 majority-rural communities.

The school made extensive efforts to ensure internet availability for all learners, regardless of their residential location. At the beginning of the pandemic, all learners returned to their homes across the Navajo Nation. To ensure they had sufficient broadband, the school distributed a survey to learners to better understand their various levels of internet access and specific residential location, down to their GPS coordinates (latitude and longitude). The survey revealed that many learners did not have access to reliable, high-speed broadband, or learners' broadband access was constrained to a speed of 1 Mbps or less, far under what is necessary to facilitate high-quality learning experiences. Based on the residential locations provided, the school developed a map of which ISPs and cellular services would reach homes. Their school staff installed the necessary equipment on learners' homes, including extending cellular coverage by installing routers and antennas. For learners who could not be reached by wired or cellular service due to little or no coverage in certain rural areas, the school installed HughesNet satellite technology. In some cases, the school distributed multiple hotspots to each learner in order for them to have sufficient broadband access for learning.

Through the pandemic, Navajo Prep was agile in adapting and modifying approaches, as they attained access to more resources and different service providers for cellular services. They are maintaining the home internet options for all learners in case the school needs to transition online in the future, as well as to ensure that learners have reliable, high-speed broadband for learning when they are home.

Partnerships between state/local governments, community-based organizations, and community anchor institutions have been integral in supporting availability for learners and families/caregivers beyond the pandemic. For example, various organizations and businesses set up stations inside their buildings for learners to use broadband at no cost. One participant highlighted a partnership between Phoenix College, City of Phoenix, the Greater Phoenix Economic Council, and the Phoenix Union School District.[83] This partnership resulted in the Phoenix Digital Education Connection Canopy, which allowed the city to launch a citywide Wi-Fi network using the K-12 school system's fiber network. The Canopy will provide 250,000 families in the Phoenix area with free Wi-Fi access. Other examples included a district and ISP partnership to place towers in different parts of the city, using buses with Wi-Fi signals to increase availability, and a district working with the local governments to install fiber, while creating pathways for learners to sustainably receive this access for free.

[83] Phoenix College. (2021, August 25). *Phoenix digital divide solution, 'PHX DECC' connects 250K families.* https://www.phoenixcollege.edu/news/2021/phoenix-digital-divide-solution-phx-decc-connects-250k-families

For highly mobile learners, participants described other types of partnerships to offer continuous broadband and device availability. For instance, community-based organizations and shelters for individuals experiencing housing insecurity or homelessness collaborated to identify learners and families/caregivers who required hotspots and understand how best to support their needs. Through this partnership, the community also advocated for connectivity in shelters and worked directly with learners and families/caregivers to meet their needs, including by installing wireless networks within shelters and distributing hotspots to families connected with or staying at a shelter. At the state level, Michigan partnered with Florida and Texas, where many migratory families were coming from, so that secondary school learners would still be enrolled in a virtual school option provided through their "home" district, while Michigan districts provided laptops, hotspots, and technical support. Michigan expects that these inter-state collaborations would be sustained post-pandemic.

Case Study: NTCA-The Rural Broadband Association Promoting Digital Inclusion by Broadband Providers

NTCA—The Rural Broadband Association represents nearly 850 small broadband providers in the most rural regions of the U.S. Consistent with its long-standing commitment to increasing broadband adoption and usage, NTCA has created focused resources to support rural broadband providers' digital inclusion efforts in their communities. These resources include a recent whitepaper and a multi-part series of online resources about the fundamentals of digital inclusion. These offer rural broadband providers with a readily implementable framework, as well as case studies of successful programs.

The association also administers the Smart Rural Community (SRC) initiative which promotes collaboration among rural broadband providers and other local leaders to deploy broadband-enabled solutions and support agriculture, economic development, education, healthcare, and other vital sectors. Through resources that showcase best practices and educational resources, SRC highlights the multifaceted impacts of high-speed networks in rural spaces. More than 200 rural broadband companies have been designated as SRC Providers, partnering with their communities to increase access to high-speed broadband for learners and their families/caregivers. For example, numerous NTCA members partnered with school districts during periods of remote learning to provide discounted or free internet to many households with school-age children.

Community leaders also highlighted partnerships with ISPs to overcome lack of large-scale infrastructure investments due to digital redlining. District partnerships with ISPs resulted in infrastructure investment at no cost to schools, which allowed nearby homes to use broadband for free for the first year, more towers placed across a community to widen the connectivity reach, and pathways for infrastructure in remote areas through state grants.

Case Study: Availability through Partnerships with the Jersey City Housing Authority

The Jersey City Housing Authority (JCHA) in Jersey City, NJ, provides affordable housing for thousands of families, seniors, and people with disabilities. JCHA had been working with ISPs to ensure residents have affordable internet, especially given a 2019 resident survey found just a third of residents had internet access and the only device available to the majority of those connected residents was a smartphone. The need to address this digital divide was accelerated by the COVID-19 pandemic. Trena Hinton, Assistant Director of Resident Empowerment and Community Engagement at JCHA shared, "People will say that [they] have access to internet or Wi-Fi, but we found out during the pandemic, especially with school-aged kids...there was not enough speed or gigabytes to really access the learning tools and the learning platforms that they need[ed]." To ensure that all residents have access to reliable, high-speed internet, JCHA put out a public bid and contracted with two ISPs to set up internet networks available at low or no cost to residents within six of their public housing developments. The ISPs provided unique solutions to address "last mile to the building" service to connect JCHA buildings to high-speed broadband. Both ISPs utilize point to point and point to multipoint architecture, existing in-building wiring, and individual in-unit Wi-Fi routers to provide connectivity within homes for learners and their caregivers/families. This project provides service to 1,500 units of public housing, including residences of over 700 school-aged youth.

In addition to making broadband available, JCHA ensured that it would be affordable for residents. Both partner ISPs participate in the ACP, and the high-speed packages offered start at $15–20 per month, a price range that is fully covered under the ACP benefit. JCHA is also attending to adoption barriers by conducting outreach to and support for residents who are currently un- or under-connected. JCHA and the ISPs ensure that all residents have the support they need to register for both the broadband service and ACP. One of the ISPs developed a streamlined application with FCC approval that allows residents to subscribe to their service using the ACP in a matter of minutes. JCHA and the ISPs also co-promote and host registration events for residents to apply for ACP and sign up for broadband with the support of JCHA employees. Additionally, JCHA included in their public bid that ISPs could not require background checks or credit checks, annual contracts, or additional fees for essential equipment to limit barriers to adoption. Finally, JCHA ensures that residents are part of the process and supports outreach through elected resident representatives and trusted, on-the-ground employees focused on digital inclusion, resident empowerment, and community engagement.

Further Opportunities to Advance Availability

The efforts described in the previous subsection can help address the availability of connectivity and devices in the short term. However, long-term investment and support is required to ensure sustainability. Learners and families/caregivers who rely on public commercial spaces for hotspots face challenges such

Digital Inclusion:[84] The activities that are necessary to ensure that all individuals in the United States have access to, and the use of, affordable information and communication technologies, such as—

- Reliable fixed and wireless broadband internet service;
- Internet-enabled devices that meet the needs of the user; and
- Applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration; and
- Includes—
  - Obtaining access to digital literacy training;
  - The provision of quality technical support; and
  - Obtaining basic awareness of measures to ensure online privacy and cybersecurity.

as flexibility in families'/caregivers' schedules, access to transportation, allocating money for gas, childcare for other young children, time to spend at these locations, and keeping focused while in busy commercial locations. In instances where learners were provided a take-home hotspot, they often faced bandwidth limitations when sharing with members of their household or attending synchronous courses on video conferencing software. Similarly, when a single device was directly distributed to households, immediate use was difficult, as quality and interoperability of the devices were often not guaranteed. For example, one participant explained that their children's school distributed tablets that were not compatible with the required learning software, and households were expected to purchase compatible devices out of pocket. Highly mobile learners require a device that can move with them or need help in acquiring a new device quickly after arriving in a new location. Highly mobile learners also require a reliable, high-speed broadband connection that does not require them to be in a specific location or rapid access to wired broadband installation without a long-term contract.

Participants saw an opportunity for greater state involvement in creating a robust, streamlined process that can provide ongoing support to all communities, especially highly mobile learners. Participants noted that 1:1, take-home device distribution is necessary to ensure both immediate availability and use beyond K-12 education. For learners from migratory families, leveraging recruiters may help identify highly mobile learners and gauge the availability and quality of their connectivity. The intersectional barriers faced by learners from migratory families, who are in foster care, who are experiencing homelessness, and who were formerly justice-involved point to a need for more tailored solutions to help them navigate their changing physical environments and digital tools.

[84] H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act, 2021

Case Study: Knowledge Sharing for Incarcerated Learners by the Vera Institute of Justice

The Vera Institute of Justice (Vera) advocates for the expansion of high-quality postsecondary education in prisons to improve the quality of life and increase opportunities post-release for incarcerated individuals. One area of focus within this advocacy is to expand access to broadband and technology tools for learning for incarcerated learners. Through the U.S. Department of Education's Second Chance Pell program, nearly 200 colleges are teaching in prisons across 48 states. Those colleges partner with state departments of corrections and the Federal Bureau of Prisons to teach learners in prison. In addition to in-person instruction, corrections departments and colleges are increasingly finding solutions for educational technology that help maintain access to courses during prison lockdowns and bring in different faculty.

For example, in April 2022, Vera co-hosted a webinar with the National Reentry Resource Center and Bureau of Justice Assistance, featuring a panel of incarcerated and formerly incarcerated learners. The panel presented to an audience of individuals working in college-in-prison and related reentry programs about successful practices in prison-based education programs. One panelist from Maine shared the benefits of having regular access to a monitored email account in the prison as an incarcerated learner—a level of access that is uncommon for incarcerated learners across the country. Another panelist from Texas shared that some prisons in the state have computer labs and classrooms with SmartBoard technology. A Texas state prison is piloting a program where two computer labs have limited internet access to allow learners to do coursework through commonly used learning management systems. By highlighting these examples, Vera is able to demonstrate how colleges and corrections departments can integrate educational technology, maintain safe facilities, and strengthen pathways for gainful reentry and employment for incarcerated individuals.

Long-term infrastructure investments are also necessary to overcome the impacts of digital redlining. Incentives for companies, competition, and an open market are needed to stimulate infrastructure development. For Indigenous communities, participants highlighted tensions between broadband connectivity and other infrastructure projects (e.g., water, electricity). According to participants, the recognition of broadband as a public utility, available for all without subsidies and specific programs, is imperative. Partnerships between governments and ISPs can help increase availability, and terms of such partnerships must align with the needs of communities. One participant explained that their city council invested heavily in public Wi-Fi networks, but the contract did not include promised speeds, impeding the expansion of access to residents.

Once infrastructure is in place, maintaining and repairing that infrastructure must be a priority, particularly for communities of color and low-income communities. Participants suggested building local capacity by training community members to maintain and repair devices and infrastructure in order to build capacity and job skills within communities.

> *It's a holistic approach. You have to talk about bringing in the infrastructure. You['ve] got to talk about maintaining the infrastructure. And you've also got to talk about really building up that technology workforce. You've got to train your communities to be able to navigate this new technology that you're introducing into the community. A lot of people are going to want to use it for school, tele-health…to run their small businesses, to order stuff.*
>
> —Reflection from roundtable focused on Native and Indigenous learners

Affordability:
Can Learners and Families/Caregivers Pay for the Total Cost of Maintaining Reliable, High-Speed Broadband Service and Technology Tools for Learning?

Affordability refers to the ability to pay for the cost of installing and maintaining a high-speed and reliable broadband connection and technology tools for learning. Barriers and strategies related to affordability impact not only the ability for learners and families to get connected, but also to have a reliable, high-speed broadband connection and to maintain that connection—including as their circumstances change over time.

Affordability Barriers Within Communities

High Cost of Broadband and Technology Tools for Learning

Participants discussed the high cost of broadband and technology tools for learning, which began before the COVID-19 pandemic, as a major barrier to learners accessing digital learning opportunities. According to participants, high cost leads to learners from low-income backgrounds having the greatest challenges. This includes families/caregivers navigating basic needs (e.g., food, gas, shelter, electricity) that compete with subscribing to and maintaining broadband. This barrier also exists at the community level, particularly for Tribal communities. Participants discussed Tribal communities not having access to electricity and clean water and Tribal leaders having to make tough decisions between essential resources.

> *We are low-income…I have seven children in our family, and they all go to school as well. And…we purchase[d] a very low price [plan] from [an] internet company…The internet connection was very bad, very poor…we need[ed] to pay more than $100 to get a better internet for my children. But still, the connection sometimes got disconnected or the connection was poor…they still need access to the computer [to complete] assignments, to do research, and everything.*
>
> —Reflection from roundtable with learners and their families/caregivers

One cause of high cost discussed by participants was lack of competition between providers, particularly in rural areas. Without competition, providers are able to charge learners and families/caregivers higher prices for broadband services. Additionally, providers may not be transparent about costs associated with services and additional fees, such as modem rentals. Moreover, eligibility restrictions prevent some families/caregivers and learners from participating in government subsidies based on their immigration or refugee status.

Learners with disabilities might have access to assistive technology and devices at school but not at home due to costs. Cost can also be a barrier to purchasing new assistive technology. Therefore, assistive technology available in schools is sometimes outdated, unable to replicate hands-on learning tools, or does not adequately meet the learners' specific needs as required by their Individualized Education Program or 504 Plan.

Lack of Sustained Funding for Affordable Internet Programs

Participants discussed lack of sustained funding for programs providing broadband and devices. Participants described many current efforts to make broadband affordable as "stopgap," emphasizing the need to increase the longevity and reach of programs. For example, grant-based funding means that communities, including Tribal communities, are often in competition with each other to receive short-term funds that end when the grant cycle is complete. Grant-funded solutions also require agencies to have the bandwidth, capacity, and expertise to continuously search for, identify, and submit proposals.

Sustained funding is also needed for programs that subsidize broadband connections for learners and families/caregivers. Many community leaders explained that barriers to signing up for these programs for learners and families/caregivers include concerns around how long funding will last and what happens to bills and coverage when the program concludes. Finally, lack of sustained funding to provide outreach for these programs prevents communities from knowing they are available.

Participants also discussed the limited funding opportunities currently available for cities, caused in part by inaccurate data about connectivity rates in urban areas (see Lack of reliable, disaggregated data to guide investments in targeted communications and supports on page 36).

Affordability Strategies Leveraged by Communities

Participants discussed initiatives and partnerships at the federal, state, and local levels that helped mitigate affordability barriers. The FCC created the Emergency Connectivity Fund (ECF) in May 2021 to support schools and libraries in providing the tools and services necessary for emergency remote learning. In December 2021, Congress additionally authorized the ACP, a $14 billion program, to ensure all households can afford broadband for education, employment, and more. Participants stated that the ECF made it possible for districts and libraries to purchase eligible equipment (including devices and hotspots) and broadband connections, and that the ACP was available to individuals who receive a number of federal and Tribal assistance programs. Specifically, the ACP allows qualifying households to reduce their internet costs by up to $30/month ($75/month on Tribal lands). Several companies, under the White House's Get Internet initiative, further committed to offer ACP-eligible households at least one high-speed plan for $30/month or less, with no additional fees and no data caps. Similarly, state and local initiatives have partnered with ISPs to provide services and devices at a lower cost.

Districts encouraged families/caregivers to use the low-cost broadband options, and some districts identified all learners who qualified for broadband support to set them up directly. Participants also discussed other ongoing strategies to mitigate costs, including fundraising, building community partnerships, and finding and applying for grants, such as existing statewide broadband grants.

Office of Educational Technology and Federal Communications Commission ACP Outreach Toolkit and Resources for Schools and Districts

As trusted community members, schools and districts are encouraged to engage in outreach to eligible families/caregivers. In doing so, schools and districts can use the FCC's outreach toolkit, with resources translated into multiple languages. In addition, schools and districts can take steps to help learners, families, and caregivers navigate the sign-up process. To access the toolkit and OET's resources for schools and districts, please visit https://tech.ed.gov/broadband/acp/.

BroadbandUSA Federal Funding Guide

BroadbandUSA's Federal Funding site connects leaders to funding opportunities that support broadband planning, digital inclusion, and deployment projects. To view the funding guide, please visit https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding.

Reduced Cost High-Speed Internet Initiatives

Through the ACP and commitments from leading internet providers, eligible households have access to low-cost internet plans and can receive a $30/month ($75/month on Tribal lands) subsidy on their bill. Several companies additionally committed to offer ACP-eligible households at least one high-speed plan for $30/month or less, with no additional fees and no data caps. This means that if households apply their ACP benefit to one of these plans, they would have no out-of-pocket cost for internet. For more information about how the Biden Administration is reducing the cost of high-speed internet, please visit https://getinternet.gov/.

Further Opportunities to Advance Affordability

The efforts described in the previous subsection can help address affordability barriers, yet more resources and expanded eligibility for affordable broadband programs are necessary to close the digital divide. Even with subsidies, participants described the cost of devices and reliable, high-speed broadband was often more than families/caregivers and learners could afford, and low-cost broadband plans sometimes did not meet the needs of learners (e.g., slow upload and download speeds, data caps, lack of awareness about conditions on data overages; see Lack of reliable, high-speed broadband connection on page 20). Eligibility restrictions for these low-cost programs also prevented many families/caregivers and learners from participating due to their immigration or refugee status. Participants also echoed a concern for the uncertainty around program end dates. Therefore, leaders must consider the unique needs and

circumstances of learners when entering into partnerships and contracts that seek to make broadband more affordable.

As leaders craft digital equity plans, another key factor to consider is sustainability of funding opportunities. For example, dedicated planning funds to support grant writing capacities would relieve communities from having to re-allocate resources or cut other programs to sustain their technology programs. Additionally, according to conversation participants, because devices and equipment require regular updates, funding opportunities must be kept consistent across state administration changes, and agencies must work in coordination to efficiently deploy funds. For Tribal communities, participants explained that state funding is not always available because of the assumption that they receive funding directly from the federal government. Tribal communities and their schools need sustainable funding through their state or territory and access to services.

Case Study: Affordable Internet and Devices for California Community College

The Foundation for California Community Colleges collaborates with 73 community college districts and 116 colleges across California. Beginning in 2014, long before the onset of the COVID-19 pandemic, the Foundation prioritized digital equity by making broadband and technology tools for learning continuously available and more affordable for learners in California. They developed programs that wove broadband access with virtual essential support resources, secured by community colleges and government leaders—such as learning management systems, online libraries and tutoring, tele-health services, academic counseling, etc.—to 2.1 million learners and created nonprofit pricing to support outreach with colleges. Through the California Connects program, learners at community colleges can receive a mobile hotspot without throttling, suspension, or overage charges for $19.99 per month—empowering subscribers with the ability to connect to learning and essential information anytime, anywhere.

Because learners need access to both the internet and a device, the Foundation created systems for colleges to make technology tools for learning available for their students through private sector partnerships focused on refurbished devices (which also allows them to overcome supply chain and affordability barriers). To make sure that devices were available when they were needed, the Foundation customized a bulk purchasing program dedicated specifically to ensure the availability of a large quantity of devices that are reserved for community colleges' needs throughout the year. To limit resource constraints on the community colleges in the interest of institutional efficiency and effectiveness, the Foundation focused on methods to send resources directly to learners' doors and mailboxes.

Amplifying efforts to support learners across the state, the Foundation also offers product bundling of a variety of resources to complement its affordable mobile hotspot offering with laptops and classroom software. Through the Foundation's digital equity and access program, a community college could buy 500 laptops, equipped with software and internet, and provide a list of recipient addresses, and the resources will be mailed directly to learners without adding additional burden to the college.

Adoption:
Do Learners and Families/Caregivers Have the Information, Support, and Skills to Obtain Regular, Adequate Access to Reliable, High-Speed Broadband Service and Technology Tools for Learning?

Adoption refers to the process by which an individual obtains daily access to broadband at a speed, quality, and capacity that is necessary, with the digital skills that are necessary to participate online, on a personal device, and on a secure and convenient network. Barriers and strategies related to adoption tend to focus on human-level challenges and strategies. They go beyond whether reliable, high-speed broadband is available and affordable to focus on whether the necessary information, support, and skill-building opportunities are provided.

Adoption Barriers Within Communities

Lack of Collaboration Between Government Agencies, Community-Based Organizations, Tribes, and Private Companies

Participants highlighted the lack of collaboration between government agencies, community-based organizations, Tribes, and private companies. They described a tendency for different sectors to work within silos to develop solutions, leading to duplicative efforts. Without partnerships, limited knowledge and expertise prevent well-intentioned efforts from seeing impact. For example, experts on the technical aspects of broadband may not consider the human elements of digital equity necessary for successful implementation. Listening session participants also discussed community anchor institutions, including local education agencies, schools, and districts, not sharing knowledge, strategies, and best practices with each other. This limits the knowledge of any single institution and their ability to best serve learners and their families/caregivers. In addition, digital equity is an intersectional issue which necessitates the education community to be in dialogue with other sectors (e.g., urban planning, environmental justice).

Exclusion of Communities Most Impacted by the Digital Divide From Conversations About Digital Equity

Participants discussed the negative effects of leaving out the voices and experiences of people most impacted by the digital divide from decision-making processes. Participants explained that when those experiences are not adequately considered, there is a disconnect between implemented solutions and what communities actually need. Moving forward without conversation leads to a lack of understanding about the community's context, needs, and wants. Moreover, participants noted that it is important to include families/caregivers of learners, as well as the learners themselves. One participant explained that age restrictions for participating in focus groups (such as only including community members over the age of 18 in conversations) can limit learner voice, particularly when working in K-12 contexts. Many community

leaders expressed frustration about engaging in these types of conversations multiple times, which has often resulted in no tangible systemic change.

> *In my opinion, there needs to be a change in culture. Oftentimes education is sidelined from conversations [with] other sectors…[T]here is so much that we can learn from other sectors in the urban planning space. There is so much to learn from our folks in the housing space, in the environmental justice space, and the health equity space… Having that culture changed catalyzes new conversation… In many ways, it starts to allow us to no longer work in silos.*
>
> —Reflection from roundtable focused on learners of color

Learners with disabilities and their families/caregivers are sometimes excluded from school or district level conversations about selecting and purchasing assistive technologies for their use. While including learners and families/caregivers requires more lead time and planning, excluding learners with disabilities and their families/caregivers from these important conversations leads to technologies that might not be accessible to the learner they were intended to support.

Distrust Between Communities and Government and/or Private Companies

Participants discussed distrust between communities and the government and/or private companies as a major barrier to new digital equity initiatives. Communities who experience marginalization often do not trust federal and state governments and private companies. In order to adopt programs aimed at providing broadband and technology tools for learning, communities need to trust both who the information is coming from and to whom they are giving their own information. This distrust is exacerbated by learner and family/caregiver identities and circumstances. For example, participants shared that immigration status leads learners and families/caregivers to be more wary of sharing information. LGBTQI+ community members have experienced exposure when electronic records are uncovered. Moreover, some Indigenous communities have a distrust of the government and systems due to past and current exclusionary practices.

When information or data is collected about learners and families/caregivers, they want to know where and how their data will be used due to concerns about privacy, surveillance, and monitoring. Participants shared that the most excluded members of communities are more likely to opt out of participating in a program if their social security number or other personally identifiable information is required because they do not know who will gain access to that information and how it may impact eligibility for other programs or legal status. Learners and families/caregivers may also be distrustful when they have had negative experiences with programs in the past. Listening session participants shared specific instances when learners and families/caregivers who signed up for low-cost programs had negative experiences due to programs providing broadband speeds that were slower than advertised or requiring credit checks. At times, programs caused confusion over how to cancel subscriptions, which led to learners or families/caregivers stopping payments without properly canceling, and therefore being prevented from coverage by the same provider in the future.

Lack of Reliable, Disaggregated Data to Guide Investments in Targeted Communications and Supports

Participants discussed the harm of not having reliable, disaggregated data. For example, overly aggregated data and data that misrepresents the availability of services results in an inaccurate understanding of learners' and families'/caregivers' access to broadband and technology tools for learning. When that inaccurate data is leveraged to drive funding and program decisions, lack of access to learning opportunities through broadband is inadequately addressed, widening the digital divide. For example, some listening session participants shared that the aggregation of data on Asian American households to include Pacific Islander, Native Hawaiian, East Asian, South Asian, and Southeast Asian families misrepresents availability for each individual group and obscures which communities need more support and resources. One participant also described how Pacific Islander-serving programs in their area are overlooked for funding that targets underrepresented or marginalized communities, despite having great need, because their community represents less than one percent of the population. Others shared that current data about connectivity in Native communities is inaccurate because it over-represents coverage for many rural Indigenous communities, does not always honor the differences between and within Native communities, and does not necessarily reflect the realities of urban Tribal communities. In cities, inaccurate data is particularly harmful for Black, Hispanic, and low-income learners due to their increased likelihood of living in neighborhoods where buildings cannot be connected or have not been connected (see Limitations of building-level infrastructure on page 24) but appear to be connected due to misreporting by ISPs.

Participants described that many schools and districts did not have data about learner connectivity at the onset of COVID-19 and emergency remote learning, which led to a lack of knowledge about which learners would be able to reliably participate in online learning. Additionally, school and district leaders described the iterative lessons they had to learn in developing surveys, as earlier iterations did not ask the necessary, specific questions, and the modalities used for distribution impacted survey completion. For example, one district explained that the large majority of learners initially reported internet access, but upon further investigation, they discovered learners reported being connected if they could access a public or commercial space that provided broadband, rather than having access at home. Further, districts highlighted when they would distribute an online survey to families/caregivers, many were not completed due to lack of broadband access. In those cases, district staff transitioned to phone surveys or other, less technology-dependent methods.

Limited Institution- and Organization-Level Capacity

Participants discussed the impact of institutions and organizations (e.g., schools, districts, libraries, colleges/universities, nonprofit organizations) having limited capacity to organize and facilitate the process of ensuring all learners have reliable, high-speed broadband. These institutions and organizations serve as community hubs, providing resources to learners and their families/caregivers, yet they do not receive adequate funding or support for this expanded responsibility. Listening session participants from districts emphasized their work to ensure learners have at-home broadband, but they also clarified this has put a significant strain on their current systems and staff. In addition, participants shared that while institutions and organizations, including Tribes, need the time, knowledge, and capacity to apply for grants for funding and support, they do not currently have these human resources. Since not all low-cost broadband programs have included dedicated funding for outreach and support, community anchor

institutions and community-based organizations have volunteered staff time to connect learners and families/caregivers, but they cannot sustain such efforts without additional resources.

> *There's just a lot of bad data. 2018 FCC data, I think, lists that 65 percent of Indian Country has access to internet, which is definitely not the case. I think those of us who live on Tribal lands definitely know that's not the case. I know that when you walk into any cell phone authorized dealer, they have these big coverage maps, and it always shows, like in my home area, which is the Navajo Nation…it always shows that area as fully connected, 4G, it's bright colored. But I live there, and I know that the best connection I have there is 3G, at best. I can send a text, maybe if I'm standing in the right spot.*
>
> —Reflection from roundtable focused on Native and Indigenous learners

Lack of Resources and Support in Learners' and Families'/Caregivers' Home Languages

Participants discussed resources and support for learners and families/caregivers not being offered in their home languages or provided in translated language that is overly technical or in a different dialect. Participants identified information about coursework, low-cost broadband and device programs, learning opportunities, technical support, and communication with ISPs is not provided in all languages spoken within a given community, including non-written languages and languages that are less-commonly spoken than English or Spanish. This lack of translation can be harmful for learners and their families/caregivers. For example, it may pose a barrier to understanding costs and services, leading to being charged above the expected price. Learners and their families/caregivers cannot broadly adopt broadband and technology tools for learning if the resources provided are not available in the language in which they are most comfortable communicating.

> *I think we just [have] to think about [the] long term with everything. How do we maintain the sustainability of everything that we talked about…? And that's fiscal, that's infrastructure, that's maintaining, that's personnel…Is that included…[for school] districts? We have been the care center of the pandemic, and families look to schools…to be the technology infrastructure of the community…I don't see it going away anytime soon.*
>
> —Reflection from roundtable focused on learners from rural areas

Lack of Inclusive Strategies for Communicating with Families/Caregivers

Participants discussed barriers faced in reaching and communicating with families/caregivers. Importantly, this barrier does not necessarily exist because families/caregivers do not want to communicate with schools, districts, and local nonprofits. Rather, the proper means of communication are often unused, and inadequate resources are available to meet families/caregivers where they are. For example, lack of outreach, information, and technical support in accessible formats bars learners and families/caregivers with disabilities from access and full participation in resources and programs. Further, many participants explained that current funding does not sufficiently support outreach. Therefore, districts and community-based organizations often leverage social media as a low-cost solution. However, this form of communication only reaches those with at least some connectivity.

When communicating with families/caregivers, specific identities or characteristics might make them more difficult to reach. For example, listening session participants reported that learners and families/caregivers who are undocumented, experiencing housing insecurity or homelessness, or in foster care might be less likely to come to school buildings for information-sharing events, particularly if they are not attending in-person classes daily. Highly mobile families/caregivers, including learners who are experiencing housing insecurity or homelessness, may be difficult to connect with because they often move to different locations.

Limited Opportunities for Digital Literacy Skills Training for Learners

Participants discussed the need for learners to develop digital literacy skills and digital resilience. They directly countered the myth that most learners already know how to use technology. One participant described how learners tend to have "fragmented knowledge" of digital tasks and therefore can have difficulties in navigating multiple learning platforms or tools. Another participant explained young learners tend to consume information successfully from digital sources, but often do not have the skills to evaluate, produce, and share their knowledge. Participants explained many families/caregivers rely on K-12 learners to navigate technology-related issues, but these learners have often not been provided explicit instruction in digital literacy skills.

Digital Resilience:[85] The ability to navigate rapid digital transformation with confidence, adapting to the increased use of e-commerce, shift to online learning, and use of tele-health services.

> *There was a time when my children and I needed connections with people. And there was no one we really knew. And not having access and connection to the internet, these days and times, that's where everything is: directions, locations, hours, numbers, addresses. All that information is now on computers and phones. And without having that digital connection, it made it very difficult to do all the other things, including school.*
>
> —Reflection from roundtable with learners and their families/caregivers

According to participants, some populations of learners face greater barriers to developing digital skills. For example, participants shared that justice-involved learners rarely have access to digital literacy training opportunities while incarcerated, but they require these skills when they re-enter communities. Without digital literacy skills, for example, these learners often struggle to demonstrate evidence or obtain transcripts for learning that took place while incarcerated. Additionally, participants discussed that without digital literacy skills, justice-involved learners may have higher recidivism rates because they are not as easily able to take part in our increasingly digital economy and society.

Learners with disabilities also require training to use assistive technologies, which may call for additional maintenance, preparation, and hands-on support from trained providers. In some cases, learning platforms and digital course materials for online instruction may lack necessary accessibility tools and features. Other platforms may have an abundance of options that require customization to be used as required by a learner's Individualized Education Program or 504 Plan.

[85] World Education, Inc. (2022). *Putting digital literacy and digital resilience into frame.* https://edtech.worlded.org/putting-digital-literacy-and-digital-resilience-into-frame/

Limited Access to Professional Learning and Digital Literacy Skills Training for Educators

Participants discussed insufficient professional learning and digital skills training for educators, including higher education faculty. This barrier was especially clear when educators had to lead digital learning experiences during COVID-19. According to participants, schools, districts, and educator preparation programs currently do not adequately build educator capacity for online and digital learning at a level that allows all educators to be comfortable using technology tools, which ultimately leads to varied learner and family/caregiver experiences. Educators also often lack training around using assistive technology or teaching learners with disabilities in virtual environments. The COVID-19 pandemic necessitated educators' transition rapidly online with limited, if any, professional learning.

Limited Access to Digital Literacy Skills Training for Families/Caregivers

Participants discussed families/caregivers' lack of access to digital literacy programs. Without digital literacy skills, when learners—particularly young learners—are using technology for learning at home, their families/caregivers are unable to support them and monitor their progress. They are unable to troubleshoot technical difficulties, log into learning management systems and software, and use digital tools to engage with their education by checking grades and attending information meetings. Families/caregivers of learners with disabilities also may not have access and/or time to participate in appropriate digital literacy skills and other training to specifically support learners with assistive technology, limiting the support they can give. Some participants also identified that, in addition to developing digital skills, leaders and community-based organizations need to focus on supporting families/caregivers in understanding the value of a broadband connection for learners' educational experiences. Finally, participants emphasized that families/caregivers could vary in age. Particular attention must be paid to help elderly family members and caregivers in multi-generational households.

> *You need access. But with access, you need the tools. With the tools, you also need the training, or what we call support…In other words, you just can't give someone the tools and expect them to succeed. So, just want to make sure that we emphasize the need for training as well as learner help desk support…We need the faculty training too. And we have to make sure the faculty have access.*
>
> —Reflection from roundtable focused on adult learners and higher education

Lack of Access to Technical Support for Learners and Families/Caregivers

Participants discussed the lack of technical support available to learners and families/caregivers. Technical support could include one-on-one assistance delivered in-person, over the phone, or online or supplemental resources, such as video tutorials or printed materials, to help learners, families/caregivers, and educators navigate technology tools and digital environments and troubleshoot technical difficulties. This support is critical for learners engaged in digital environments, including full-day online learning or shorter digital learning experiences for tutoring or other needs. Many learners and families/caregivers currently do not have access to technical support, particularly outside of regular business hours when learners and families/caregivers often require the most support. Without technical support for families/caregivers, learners may not have the support for learning they regularly have during the school day.

Lack of Support to Complete Applications for Affordable Broadband Programs

Participants discussed the lack of support available for learners and families/caregivers to complete applications for affordable broadband programs and other services, as they may not fully understand the programs' scopes, not have access to the internet or devices to complete online applications, require support to prove eligibility, or not understand the technical specifications of the plans available to them. Participants described the enrollment process for affordable broadband programs as burdensome, time-consuming, complicated, and at times, overly invasive for learners and families/caregivers. Specific barriers during the enrollment process included having multiple steps and disjointed systems, needing to wait for confirmation emails before continuing with the process (therefore not being able to complete it in one sitting), and not having all of the necessary information to compare costs and find the best options. Listening session participants described family/caregiver and learner concerns over what happens if their income changes or a program ends, whether credit checks are necessary, and if they need to provide social security numbers.

> **Technical Support:**[86] Consistent and reliable assistance for maintaining, renewing, and using information and communication technologies and digital learning resources.

Moreover, learners and families/caregivers with limited English proficiency, who are refugees, or who are experiencing housing insecurity or homelessness experience unique barriers in completing applications for affordable broadband programs. Language barriers can prevent learners and families/caregivers from getting information about affordable broadband programs and their scopes. Learners and families/caregivers who are refugees receive large amounts of information upon arrival in the U.S. and need to complete other applications for services before they are able to sign up for affordable broadband programs, all of which require support to navigate. Additionally, financial barriers, such as credit checks and down payments, can inhibit newly arriving learners and families/caregivers from accessing programs. When programs require a single address, learners and families/caregivers who are experiencing housing insecurity or homelessness (including formerly justice-involved individuals who experience high levels of housing insecurity and homelessness) are not able to gain access through the program.

Adoption Strategies Leveraged by Communities

Digital Literacy Development for Learners, Families/Caregivers, and Educators

Districts, schools, community anchor institutions, and community-based organizations have not only been key players in expanding Wi-Fi access and loaning devices and hotspots, but also providing support for digital literacy skills training for a variety of audiences. During COVID-19, educators in some districts visited families/caregivers to provide direct support for using devices and accessing content online. Districts, community-based organizations, and libraries also held various workshops to promote digital literacy among learners, educators, and families/caregivers.

> *And I think in the digital equity field, when we talk about…it's not just access. It's not just availability. It's also adoption. That adoption is a human interaction. It is a relationship at its core.*
>
> —Reflection from roundtable focused on adult learners and higher education

[86] International Society for Technology in Education (ISTE). (2022). *Technical Support.* https://www.iste.org/standards/essential-conditions/technical-support

Case Study: Learner and Educator Support for Learning and Teaching in Digital Environments at Quinsigamond Community College

Quinsigamond Community College (QCC) in Massachusetts recognizes the barriers their learners face in accessing broadband and technology tools for learning. They are committed to providing technical and program support to ensure all learners have the necessary resources to be successful in their coursework, particularly in courses taught in online (asynchronous) or remote (synchronous) learning environments. In addition to purchasing devices and hotspots for learners, QCC hired online advisors to support learners who are engaging online and remotely (beyond their existing academic advisors and faculty). These online advisors use both analog and digital communications to reach out to learners who are not engaging in courses, provide basic digital literacy training, and ensure structured support for course success.

At QCC, digital equity for learners is also intricately tied to faculty support. All QCC faculty members who are teaching an online or remote course are required to complete training in quality instructional methods. In addition, the QCC Center for Academic Excellence trains faculty on online course delivery and provides resources necessary to teach online. The Center for Academic Excellence's ongoing staff development is not only led by leaders and experts but also by fellow faculty members. This peer-to-peer knowledge-sharing ensures that workshops are relevant and comprehensible for faculty member attendees.

QCC continues to use and expand on these digital equity strategies, even as in-person courses have returned. For example, QCC is leveraging data and learner experience feedback to ensure that taking courses online or remotely does not inequitably disadvantage learners. Specifically, they are using course success data to determine where learners need support and which learners need to be prioritized. Currently, QCC is seeing a 5 to 10 percent difference in course success rates between in-person and online/remote courses. QCC is also observing lower course success rates for Black learners, Hispanic learners, and learners who identify as men as compared to the full learner body. This demonstrates the work that is still needed and how critical QCC's continued support is for providing high quality access to learners and educators.

Communities have used a number of different strategies to reach populations furthest from digital opportunities. For example, one community hosted digital literacy workshops around learners' and families'/caregivers' schedules and provided food and childcare, so that families/caregivers had the necessary support to fully participate. Community-based organizations also provided digital literacy support to refugee learners in-person or over the phone. Participants also described approaches where districts created tutorial videos in multiple languages for learners and families/caregivers, working with multilingual youth to create videos, and providing direct training for families/caregivers to support their children. The state of Massachusetts recently created a Broadband Innovation Fund to support digital literacy building opportunities, including at community anchor institutions.[87] Through a partnership

[87] Broadband Innovation Fund, Mass. Gen. Laws ch. 10, § 10:35SSS (2021). https://casetext.com/statute/general-laws-of-massachusetts/part-i-administration-of-the-government/title-ii-executive-and-administrative-officers-of-the-commonwealth/chapter-10-department-of-the-state-treasurer/section-1035sss-broadband-innovation-fund

between the Urban League of Essex County and Invest Newark,[88] a technology center provided professional and digital skills development for educators, as well as digital literacy training for Newark residents and college and workforce preparation opportunities for middle- and high-school learners. Some higher education institutions have also pivoted their approach to building digital literacy by providing one-on-one support with extended hours for learners who are navigating hybrid and asynchronous environments.

Case Study: Collaborative State and Community Initiatives for Digital Skills Training in Refugee Communities

During the pandemic, the Migration Policy Institute (MPI) sought to strengthen partnerships between refugee resettlement networks and organizations promoting digital equity. In the fall of 2020, MPI partnered with the Maryland Office for Refugees and Asylees (MORA) to increase digital access and adoption among refugee communities. MPI delivered technical assistance over a series of four sessions to MORA and its newly established Maryland Digital Work Group, which included participation from four local resettlement agencies. Together, they developed a multi-pronged approach to increase refugees' access to devices, the internet, and digital skills training in languages used by the local refugee population in Maryland. MPI linked MORA with PCs for People, a national nonprofit organization that offers refurbished computers at low-cost, and the Baltimore Digital Equity Coalition. This connection led to local resettlement agencies distributing 70 computers and hotspots to refugee households. Local resettlement agencies continue to partner with PCs for People even after the end of the technical assistance period, showing promise for longer-term, sustainable engagement. MPI also connected MORA with Byte Back, a nonprofit organization that specializes in training under-resourced communities in digital skills, to explore the possibility of adapting an existing curriculum to train multilingual refugees as digital navigators, who can train their community members and serve as ambassadors to the digital world.

MPI has recently produced a report on Advancing Digital Equity Among Immigrant-Origin Youth, which highlights insights from refugee resettlement staff, community leaders, educators, and library and IT professionals working to support immigrant-origin youth.

For learners who are justice-involved, digital literacy programs may be provided through districts, education divisions within state corrections departments, or by adult learning and higher education institutions. Prisons may be served by grantees in the federal TRIO programs[89], which support the progress of learners from disadvantaged backgrounds from middle school to post-baccalaureate programs. In Wisconsin,[90] a newsletter distributed through a community-based organization to prisons acts as a vehicle

[88] ROI-NJ. (2021, October 1). *Invest Newark, Urban League launch Tech House — an effort to bring high-speed internet, STEM classes to more of city.* ROI- NJ. https://www.roi-nj.com/2021/10/01/tech/invest-newark-urban-league-launch-tech-house-an-effort-to-bring-high-speed-internet-stem-classes-to-more-of-city/

[89] U.S. Department of Education. (2022, June 6). *TRIO Programs.* Federal Trio Programs - Home Page. https://www2.ed.gov/about/offices/list/ope/trio/index.html

[90] The Community. (n.d.) *The Community.* https://thecommunitynow.us/

for digital skills development for justice-involved learners that do not have direct, consistent access to technology. The organization is also supporting justice-involved individuals with developing digital literacy through both digital and analog learning opportunities.

Participants also noted professional learning opportunities for educators. One Tribal college requires faculty to have certification to teach online and is creating counseling support for online engagement with learners. The U.S. Department of Education's COVID-19 Handbook Volume II[91] also shares considerations and resources for educator professional learning opportunities that support effective use of technology.

Case Study: Flexible Supports for Learners and Educators with Digital Access in Roselle Public Schools

Roselle Public Schools is focused on "Every Student Everyday!" and meeting learners where they are by any means necessary to support learning in digital environments. Their ongoing 1:1 program offers 100 percent access to devices and internet for K-12 learners and provides flexible support for both learners and educators.

For example, Roselle Public Schools wanted to provide on-demand academic support beyond the traditional school day. To meet this goal, they began utilizing PAPER. This online platform provides learners with 24-hour access to homework help, tutoring, writing feedback, and study support from certified teachers on-demand, synchronously, and in multiple languages. Since it was launched in the middle of the 2021-2022 school year, the district has seen large usage of PAPER tutoring to support learners beyond the traditional school day, removing the time- and space-related barriers to assistance that existed previously.

For educators, one form of flexible support is flexible professional learning opportunities, known as the Professional Development Menu (PDM). Through the PDM, educators can receive professional learning opportunities on demand, with an emphasis on using a variety of technology tools more seamlessly within classrooms and building a digital archive of best practices from across the district. The PDM provides an alternative to traditional professional learning models and allows teachers the flexibility to tailor their own professional learning experiences, actualize their individual pathways for learning, and strengthen their pedagogy.

[91] U.S. Department of Education, Office of Planning, Evaluation and Policy Development. (2021). *ED COVID-19 Handbook, Volume 2: Roadmap to Reopening Safely and Meeting All Students' Needs.* Washington, D.C. https://www2.ed.gov/documents/coronavirus/reopening-2.pdf

With learners and educators returning to in-person learning, Roselle Public Schools has begun reevaluating their resources and efforts to ensure they focus on all aspects of digital inclusion. They have revisited how all resources are distributed across grade levels and across the district to ensure digital tools and accessibility remain equitable for all learner subgroups. They are also focused on digital citizenship and the necessary digital literacy skills training for learners and families/caregivers, as they broaden the scope of this work to optimize school-home partnerships.

Human-Level and Technical Support for Learners, Families/Caregivers, and Educators

Participants emphasized the importance of district- or community-led hotlines and help desks for technical support. In-person resources such as digital navigators, digital coaches, and library-based programs were also key supports. Participants specifically highlighted the essential and multi-faceted role digital navigators play in serving their communities. As trusted members of their community, they collect data on the common barriers faced, support families/caregivers in signing up for ACP, and provide digital skills training and 1:1 technical support. Community anchor institutions and community-based organizations have also been integral in supporting elderly family members/caregivers and immigrant and refugee families by providing connectivity support in-person or virtually. In certain instances, services have included home visits to ensure refugee learners could access school, communicate with educators, and enroll in classes. One participant shared there are monthly support groups across their state for grandparents for digital literacy development.

Case Study: Adoption and Support Call Center from Communities In Schools of Nevada

With schools relying on remote instruction throughout Nevada in the fall of 2020, the "Connecting Kids" public-private partnership was developed between public school districts, charter schools, the Nevada Department of Education, community groups, businesses, state agencies, local municipalities, nonprofit organizations, education advocacy groups, Chambers of Commerce, food banks, and more to ensure that 100 percent of learners had access to broadband and devices. As part of the Connecting Kids initiative, Communities In Schools of Nevada, in partnership with the Clark County School District, opened the Connecting Kids Nevada virtual Family Support Center. The Family Support Center, staffed by 150 employees, operated 12 hours per day, six days per week to sign up eligible families/caregivers for subsidized internet through a partnership with Cox Communications or hotspots in partnership with T-Mobile. Support Center staff spent whatever time was necessary to connect with families/caregivers and walk them through the entire registration process. Tami Hance-Lehr, CEO, shared, "Some of my agents would be on the phone for 30 or 45 minutes, either walking them through how the program was going to work [or] literally walking them through the application, and helping them fill it out themselves. That was a big win for us. We didn't just say, 'Here's the

website. Go fill out your application.' We literally made a deal with Cox Communications that we filled out the application on behalf of them."

As Hance-Lehr references, the Family Support Center created a specialized process with Cox Communications that allowed call center staff to complete the registration process on behalf of learners and families/caregivers with their recorded verbal consent. This reduced adoption barriers to applications and ensured families/caregivers not only learned about programs but were able to register. If a learner or family was not ready when they were initially called, a supervisor would call back a few days later to check back in with the unconnected family and answer any additional questions they had about available programs. Because of the reputation the Family Support Center garnered for answering all questions, trustworthiness, and support, the call center became an essential hub for learners and families/caregivers and has expanded to support families/caregivers with other needs including SNAP benefits, social worker needs, housing, and more. If they could not answer a question immediately, center staff found a solution and called families/caregivers and learners back. In total, the Family Support Center has connected 18,000 families to reliable, high-speed broadband and has fielded over 45,000 calls. Even after every learner has been connected and school has returned to in-person settings, the Family Support Center call center is still open for learners and families/caregivers to reach out to. It is now operated by the Clark County School District.

Whole Community/Ecosystem Engagement

Participants highlighted how collaboration with learners and families/caregivers and between organizations helped to build trust and deepen impact. Soliciting regular feedback from learners, families, and caregivers is integral not only to hear about current, pressing needs but also to co-create solutions and thereby build trust and buy-in from community members. For example, participants from Ector County Independent School District, TX (see Case Study on page 46 for further information) mentioned that a local task force solicited feedback from learners and families/caregivers through multiple methods (e.g., social media, pencil-and-paper) to assess their levels of access to broadband and technology tools for learning. Recognizing the larger community need for digital equity (rather than just the needs of learners), the task force includes community-based organizations, local government leaders, businesses, and the school district and is identifying how everyone can benefit from affordable and available broadband. Other participants discussed their districts setting up data-sharing agreements, so that learners would not lose access to devices if they move out of the district.

> *I would encourage you also to think…broadly about not just education institutions but also sort of the broader ecosystem that students are going to be engaging with, whether it's other kinds of community support, faith programming, libraries, what have you. I'm thinking sort of a little bit more broadly about, how is this whole thing…going to be moving together? Education is just one slice of that. I think it's going to be really important.*
>
> —Reflection from roundtable focused on adult learners and higher education

Case Study: Community Partnerships in Ector County Independent School District

For Ector County Independent School District (ECISD) in rural West Texas, community partnerships have been integral to connecting learners, families/caregivers, and the community to affordable and available broadband. The beginning of the pandemic revealed that 39 percent of learners lacked either available or affordable broadband in their homes. In response, ECISD developed a series of partnerships for a variety of short-term solutions for learners and families. From there, a local task force, including the school district, nonprofit organizations, local government entities, and business leaders, was formed to evaluate the challenges associated with internet connectivity and develop a county-wide plan for broadband. At first, the conversation centered around learners disconnected from school due to the sudden pivot to remote learning and the large number of children living in unconnected or under-connected areas of Ector County. The task force realized there was a bigger need for connectivity, specifically thinking about access in a way that the entire community can benefit, and improving services like tele-health options, and economic development opportunities, among other applications. This framing has invited more community members to actively engage and work on creating short term solutions, while brainstorming permanent ones that can solve the challenge of connectivity for all of Ector County.

Providing Support for Enrolling in Affordable Internet Programs

Schools were recognized as key hubs to facilitate information dissemination and resource distribution due to their centrality to learners and their families/caregivers, as well as capacity and expertise to provide translations and accessibility accommodations as necessary. Participants highlighted the role that community-based organizations and community anchor institutions, schools, and districts, as trusted messengers, play in supporting learners and their families/caregivers to learn about and enroll in federal programs, such as ACP. Many community-based organizations printed out materials and disseminated information about the ACP over the phone and through partnerships with schools. District staff also helped families/caregivers complete paperwork for eligible programs and provide support through the process. Guidance counselors and youth fluent in languages spoken in the community additionally contributed to spreading awareness and knowledge about the programs.

Case Study: Learner Voice at Maine West High School

Amplifying learner voice is a priority for Maine West High School in Illinois. The school has created multiple pathways and supports for students to lead, collaborate with their peers, and to advise and engage with school leadership. For example, students, through a formal application process, can join the Principal's Leadership Team (PLT). Currently, this advisory board includes

40 students who report directly to the principal, providing advice and feedback solicited from their peers on a monthly cadence. The PLT solicits feedback from their peers every Friday, inquiring on a variety of topics such as school lunch prices, the current advisory model, school schedule, and the hours of operation of their test retake center. The PLT also has a podcast committee that serves as a platform for students to share about their experiences academically and personally at Maine West. The school has also sponsored a Student Voice Committee, open for any student to actively partake in. The Student Voice Committee comes together weekly, where during this time, no club meetings or teacher meetings can occur. The meeting is dedicated to providing feedback to teachers on the listed agenda items and creating action items to follow up on. The committee also solicits feedback from their peers through surveys embedded in QR codes, inquiring on what the committee is doing well and what they could improve. This support for learner agency and the cycle of continuous feedback has promoted trust among peers and school leadership. To date, Maine West has worked to ensure that all students have access to the devices and internet access they need, but the PLT is a location where students could raise concerns about digital equity and voice their needs as further needs arise.

Further Opportunities to Advance Adoption

While the efforts previously described can help drive adoption of broadband and technology tools for learning, long-term investment and capacity is essential to sustain efforts to advance adoption. For example, hotlines and help desks often have insufficient staffing. However, learners need no-cost, readily available, and on-demand support after typical business hours that is provided by the district, local government, or another organization. This technical support is necessary even when learners and families/caregivers have strong digital literacy skills, as they will inevitably run into issues they cannot troubleshoot themselves.

For learners with disabilities, once an appropriate device is identified and acquired, the learner, family/caregiver, and professionals who work with the learner should receive training to use the device and ensure access to learning platforms and course materials. Support from educators, related service providers, and families/caregivers is critical to ensure every learner with a disability has access to a free appropriate public education. Furthermore, for justice-involved learners, participants suggested states and territories should share information about affordable broadband and device programs and digital literacy building opportunities within reentry programs.

Digital communication methods (e.g., social media, videos) are important to reach some learners and families/caregivers, but by themselves, they are insufficient to reach learners and families/caregivers who do not have access to broadband or digital skills development opportunities. Analog communication methods should also be considered. However, they require more people power and greater time, resources, and effort. Leaders should collaborate with community anchor institutions and community-based organizations to sustainably support both digital and analog communication methods to reach all learners and families/caregivers.

Lastly, there needs to be trusted support at every stage of the sign-up process, such as translators for multilingual communities, resources highlighting eligibility criteria for services, explicit guidance on

how to use the internet, and dedicated personnel who can provide real-time support as learners and families/caregivers complete applications for supports and services. When working to provide trusted support, consider:

- Services and communication should be available for learners and families/caregivers in their home language. When translations are made available, they should use vocabulary and terms with which local learners and families/caregivers will be familiar, free of overly complicated language or jargon.
- Surveys can help illuminate learner and family/caregiver needs, and organizations should be cognizant about whether such instruments are constructed in a manner that is accessible to all, including those with low digital literacy skills or individuals with disabilities. Leaders should also collaborate directly with communities in their data collection to encourage participation and ensure all voices are heard.
- Community anchor institutions and community-based organizations can serve as trusted hubs within many communities and support families/caregivers and learners in adopting broadband. This type of collaboration should intentionally attend to the expertise of each group and the knowledge and relationships they bring.
- Learners and families/caregivers also need support to understand their options for broadband plans, including how much data and bandwidth will be sufficient for their own or their learners' educational needs. Learners and families/caregivers require clear and transparent information and accessible technical support to make informed decisions without fear of hidden details or fees.

Center on Inclusive Technology & Education Systems

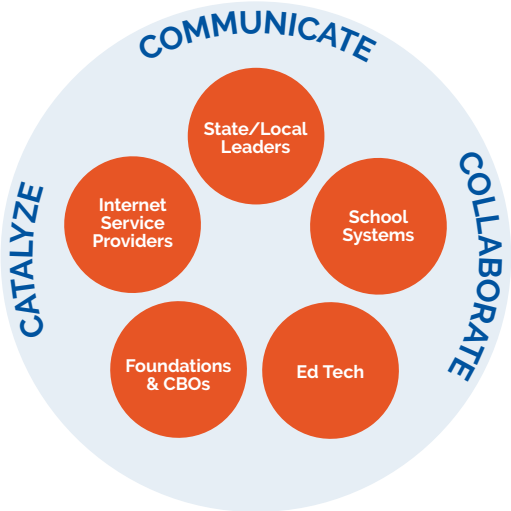
The Center on Inclusive Technology & Education Systems (CITES) supports districts in creating and sustaining inclusive technology systems that serve all students, including students with disabilities who require assistive technology or accessible educational materials. A framework of evidence-based practices to enhance the successful use of technology to foster learning and life success is in development. Visit https://cites.cast.org/more/district-examples to read exemplary case stories and vignettes of districts implementing inclusive technology practices.

> *When we're talking about equity...we're talking about human dignity and worth. So, we are communicating in very clear terms that some people are disposable and some people are not, that some people should be afforded the respect...that their human dignity, their worth to the society is affirmed and not...Equity comes from a space of who is seen. And how do we express that value? And we express that even in our equity initiatives...so I always wonder, how do we think about digital equity with an understanding or an expectation that all people are worthy and we need to help get them where they need to be?*
>
> —Reflection from roundtable focused on Native and Indigenous learners

Conclusion

COVID-19 accelerated the global shift to a digital economy and society, as well as the resulting transition of essential components of everyday life, such as education, employment, and healthcare, to online systems. Public investment into digital equity can enable all learners to fully participate in this shared future, characterized by increases in healthcare options, workforce opportunities, and more.[92] While some progress has been made toward digital equity in recent years, further efforts are necessary to ensure learners of all backgrounds, identities, and experiences have access to reliable, high-speed broadband and technology tools for learning. Numerous barriers currently limit this access. However, through a focused attention to availability, affordability, and adoption, communities can continue to develop promising strategies to overcome barriers and work toward digital equity.

Cross-Sector Actions



COMMUNICATE: Leverage targeted communications methods to raise awareness and understanding of policies and programs that support learners, families/caregivers, and communities in their equitable participation in a digital economy and society.

COLLABORATE: Partner across sectors to work toward a shared vision for digital equity that is reflective of the needs of learners, families/caregivers, and communities:

- State and local leaders will partner across agencies and offices to leverage collective resources, capacity, and expertise to prioritize and invest in broadband availability, affordability, and adoption.
- School systems will partner with community-based organizations and anchor institutions that enable and extend access to technology-empowered learning experiences.
- ISPs will partner across sectors to conduct inclusion campaigns on affordable connectivity and device options and offer linguistically and culturally inclusive and accessible technical support.
- Foundations and community-based organizations will partner across sectors to identify and scale "what works" in digital inclusion, such as efforts to build digital readiness and digital literacy.
- Educational technology industry leaders will partner with learners, educators, families/caregivers, and school communities to co-design technologies that ensure active and accessible learning experiences, cultural responsiveness, and linguistic diversity.

[92] Ochillo, F. (2022). *The economic consequences and generational impact of the digital divide.* Technology and Public Purpose Project, Belfer Center for Science and International Affairs, Harvard Kennedy School. https://www.belfercenter.org/sites/default/files/files/publication/TAPP-Francella_Impact%20of%20the%20Digital%20Divide_Final_220516.pdf?utm_source=sendgrid&utm_medium=email&utm_campaign=Newsletters

CATALYZE: Accelerate progress toward digital equity by leveraging data that identifies barriers and building on the unique role that each sector can play in representing and meeting diverse needs and perspectives of learners, families/caregivers, and communities:

- State and local leaders will accelerate progress toward digital equity by inviting constituents to co-create and contribute to a shared vision, policies, and programs focused on creating an equitable digital economy and society.
- School systems will accelerate opportunities for technology-empowered learning by inviting families/caregivers, learners, educators, and community members to identify and contribute to digital inclusion goals.
- ISPs will accelerate broadband adoption by examining the availability and quality of connections and leveraging low/no cost options and programs such as the ACP to deliver high-quality, reliable access to the internet.
- Foundations and community-based organizations will accelerate awareness of the needs of learners, families/caregivers, and communities through ongoing research on and communication of adoption strategies and existing barriers to fully participating in the digital economy and society.
- Educational technology industry leaders will accelerate the inclusivity and accessibility of devices, tools, platforms, and instructional content to flexibly support a wide range of active learning experiences and needs.

Individual communities cannot do this work alone. Although educators and education leaders have been critical drivers of digital equity, partnerships and cross-sector collaborations are imperative to ensure this responsibility does not solely fall on them. We call on leaders from various sectors to collaborate with community members to co-create solutions that accelerate progress toward digital equity. Suggested action steps are noted below.

The historic federal investments authorized by the Infrastructure Investment and Jobs Act offer critical opportunities for broadband planning that can identify and equitably address the various availability, affordability, and adoption challenges described throughout the previous sections. Using this guidance resource as a starting point, it is essential that leaders collaborate with those most impacted by the digital divide to develop comprehensive digital equity plans that outline strategies to meet the needs of learners, their families/caregivers, and communities effectively and sustainably.

Key Steps for Leaders to Ensure Access for All Learners, Families/Caregivers, and Communities

Grounded in the barriers to and strategies for accessing broadband and technology tools for learning shared by community leaders and members in listening sessions, this section provides key steps for leaders as they develop strategies for working toward digital equity. Each community will require collaboration among leaders and community members to co-develop and implement strategies that are aligned to their unique circumstances and address the three components of access—availability, affordability, and adoption.

Develop and earn public trust through partnerships

- Leaders develop cross-sector coalitions bringing together state or territory and local government agencies, Tribes, K-12 school districts, higher education institutions, edtech companies, ISPs, nonprofits, local philanthropies, and other trusted community leaders. Leaders work with partners to develop long-term, sustainable solutions, while providing immediate, tested, interim solutions that provide access to broadband in the meantime.
- Leaders work in partnership with the coalition to co-develop strategies, protocols, and best practices for hosting community-led conversations with those who are most impacted by the digital divide and learn about the evolving barriers and needs within each community.

Learn from those impacted by inequitable access and provide opportunities for feedback

- Leaders prioritize partnering with community-based organizations to engage with learners, families/caregivers, and communities most impacted by the digital divide. They collect representative and accurate, disaggregated information and data around the availability, affordability, and adoption of broadband and technology tools for learning.
- Leaders create safe and confidential spaces for community members to share information and feedback. The goal of these conversations is to understand learners' needs and create space for determining the most appropriate course of action. Accessibility and cultural responsiveness are vital to creating meaningful and inclusive conversations. Leaders provide translators for each language spoken throughout the community, hold the conversations in a location that is accessible and convenient for participants, and identify and provide accommodations for participants with disabilities. For example, virtual conversations may not be accessible to community members who do not have access to reliable, high-speed broadband or devices. Other community members may not have a mode of transportation or flexible work hours and may need to participate virtually.
- Leaders provide support to make the experience meaningful for community members, such as providing a meal, childcare services, and digital inclusion navigators to support community members in learning about and enrolling in available digital access programs.
- Leaders provide community leaders and members with updates on progress implementing the digital equity plan. As digital equity plans are maintained and adjusted, leaders continuously consult community leaders and members for feedback on progress and proposed strategic shifts.

Co-develop clear goals and strategies with communities to craft a comprehensive digital equity plan

- When bringing together government agencies to develop a digital equity plan, leaders include those outside of the information technology sphere. Leaders invite both education agencies and those focused on other aspects of learners' and families' lives that require broadband, such as health and human services, housing, energy, environment, labor, and justice, including corrections. Education agencies, specifically, can help to gather data from learners and their families/caregivers, convene necessary partners such as educators and librarians, coordinate technology procurement, and ensure digital equity efforts will positively impact learning goals.
- Leaders recognize the unique expertise and experiences of each member and organization involved in the partnership. The most meaningful partnerships will be grounded in trust, where participating members and organizations value and respect one another. Leaders acknowledge, name, and attend to the power imbalances and assumptions of knowledge that exist and work to actively counter these notions.
- Leaders, in partnership with community-based organizations and community anchor institutions, use asset-mapping to identify strengths of the community and existing programs that can be leveraged and extended. Leaders use currently successful strategies as a basis for scaling up.
- While leaders build and implement long-term solutions to meet existing needs, they also ensure communities can maintain the short-term solutions in the meantime. Districts, schools, institutions, and communities have built temporary solutions to create immediate fixes to systemic issues. Leaders ensure funds are used to invest in community members and organizations for the time, effort, and expertise they bring to the partnership and conversations.

Raise public awareness and provide ongoing support for low- or no-cost broadband programs

- Leaders, in partnership with community-based organizations and community anchor institutions, engage in outreach through both analog and digital communications methods, in accessible formats, and in multiple languages to share available programs.
- Leaders, in partnership with community-based organizations and community anchor institutions, provide ongoing, multilingual, and personalized support (such as digital navigators) for families/caregivers and learners to learn about and register for low-cost broadband programs. Personalized outreach from people that community members know and trust is essential to get buy-in for programs and to support their enrollment.

Provide digital literacy training and professional learning opportunities

- Leaders identify and share broadly all resources available to support digital literacy training, particularly multilingual and accessible offerings.
- Leaders work with schools, districts, and institutions of higher education to create professional learning opportunities for educators and faculty to improve their digital instruction practices.
- Leaders, in partnership with community-based organizations and community anchor institutions, provide multilingual, on-demand technical support, which is essential for learners and families to maintain their connection to broadband.

Appendix

Methodology

This guidance resource is grounded in the experiences of many community members and leaders across the U.S. Digital Promise, contracted by OET, hosted a series of six listening sessions with representatives from populations who are often most impacted by the digital divide. These conversations considered the perspectives of those leading work to support learners of color, Native and Indigenous learners, learners from rural areas, learners from urban areas, and adult learners and higher education learners. The final conversation specifically brought together learners and family members/caregivers personally experiencing the digital divide.

Digital Promise developed questions uniquely tailored to each conversation to support rich discussion among the communities represented in the session. Following the listening sessions, Digital Promise analyzed key takeaways from these conversations through a systematic replicable process that avoids bias to distill barriers and strategies, craft the strategic guidance points, and highlight case studies. Following the listening sessions, Digital Promise shared the takeaways with listening session participants as a follow-up for feedback and clarification. Case studies were also shared with relevant participants to ensure accuracy.

To supplement the conversations coordinated by Digital Promise, OET joined additional listening sessions hosted by the Education for Homeless Children and Youth Program, ED's Office for Civil Rights, ED's Office of Communications and Outreach, ED's Office of Indian Education, ED's Office of Migrant Education, Empowering Pacific Islander Communities, National Center on Deaf-Blindness, and SPAN Parent Advocacy Network. These listening sessions focused on the barriers experienced by families/caregivers, learners experiencing homelessness, learners with disabilities, migratory learners, and Native Hawaiian, Pacific Islander, and Indigenous learners, as well as strategies for navigating those barriers. Insights from these listening sessions further informed this guidance resource.

OET also conducted individual meetings with numerous subject matter experts and organizations that work with populations furthest from digital opportunities to receive their feedback and perspectives. These insights have additionally informed this guidance resource.

Glossary

Adoption of Broadband:[93] The process by which an individual obtains daily access to the internet—

- at a speed, quality, and capacity—
  - that is necessary for the individual to accomplish common tasks; and
  - such that the access qualifies as an advanced telecommunications capability;
- with the digital skills that are necessary for the individual to participate online; and
- on a—
  - personal device; and
  - secure and convenient network.

Bandwidth:[94] The rate at which the network can transmit information. Generally, higher bandwidth is desirable. The amount of bandwidth available to you can determine whether you download a photo in two seconds or two minutes.

Broadband:[95] "Broadband" is generally shorthand for quality internet service. Broadband provides high-speed internet access via multiple types of technologies, including fiber-optics, wireless, cable, DSL, and satellite.

Community Anchor Institution:[96] An entity such as a school, library, health clinic, health center, hospital or other medical provider, public safety entity, institution of higher education, public housing organization, or community support organization that facilitates greater use of broadband service by vulnerable populations, including, but not limited to, low-income individuals, unemployed individuals, children, the incarcerated, and aged individuals.

Community-based Organization:[97] A private nonprofit organization of demonstrated effectiveness, Indian Tribe, or Tribally sanctioned educational authority, that is representative of a community or significant segments of a community and that provides educational or related services to individuals in the community.

Digital Equity:[98] The condition in which individuals and communities have the information technology capacity that is needed for full participation in the society and economy of the United States.

Digital Inclusion:[99] The activities that are necessary to ensure that all individuals in the United States have access to, and the use of, affordable information and communication technologies, such as—

- Reliable fixed and wireless broadband internet service;
- Internet-enabled devices that meet the needs of the user; and
- Applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration; and

[93] H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act, 2021

[94,95] U.S. Department of Education, Office of Educational Technology, 2021a

[96] National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce, 2022

[97] H.R.1 - 107th Congress (2001-2002): No Child Left Behind Act of 2001, 2002

[98,99] H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act, 2021

- Includes—
  - Obtaining access to digital literacy training;
  - The provision of quality technical support; and
  - Obtaining basic awareness of measures to ensure online privacy and cybersecurity.

Digital Literacy:[100] The skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information.

Digital Navigator :[101] An individual who addresses the whole digital inclusion process—home connectivity, devices, and digital skills—with community members through repeated interactions.

Digital Redlining:[102] The practice of creating and perpetuating inequities between already marginalized groups specifically through the use of digital technologies, digital content, and the internet. For example, ISPs invest in building fiber infrastructure in wealthier neighborhoods, while under-investing in the broadband infrastructure in low-income communities resulting in low-income broadband users with more expensive, slower access.

Digital Resilience:[103] The ability to navigate rapid digital transformation with confidence, adapting to the increased use of e-commerce, shift to online learning, and use of tele-health services.

Fiber-optic:[104] A system that uses glass (or plastic) to carry light, which is used to transmit information. Typically, each side of the fiber is attached to a laser that sends the light signals. When the connection reaches capacity, the lasers may be upgraded to send much more information along the same strand of fiber. This technology has been used for decades and will remain the dominant method of transmitting information for the foreseeable future.

Hotspots:[105] Wi-Fi Hotspots are physical locations, such as an airport or coffee shop, where people can wirelessly connect their device(s) to the internet using Wi-Fi via a wireless local area network (WLAN). A mobile or portable hotspot uses a cellular data connection, such as through a smartphone, to connect or "tether" their device(s) to the internet.

High Speed Access:[106] Access that is not less than 100 megabits per second for downloads nor 20 megabits per second for uploads and latency that is sufficient enough to support real-time, interactive applications

Technical Support:[107] Consistent and reliable assistance for maintaining, renewing, and using information and communication technologies and digital learning resources.

Technology Tools for Learning: Devices, hardware, software, and technology-based services used in in-school and out-of-school contexts for learning.

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[100] H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act, 2021

[101] National Digital Inclusion Alliance, n.d.

[102] U.S. Department of Education, Office of Educational Technology, 2021a

[103] World Education, Inc, 2022

[104, 105] U.S. Department of Education, Office of Educational Technology, 2021a

[106] H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act, 2021

[107] International Society for Technology in Education (ISTE), 2022

Unconnected: Learners and families not having access to devices and internet service.

Under-connected:[108] Learners and families whose access to devices and internet service is unreliable or insufficient to fully participate in society.

[108] Katz & Rideout, 2021

Acknowledgements

Project Team

Advancing Digital Equity for All: Community-Based Recommendations for Developing Effective Digital Equity Plans to Close the Digital Divide and Enable Technology-Empowered Learning was developed under the guidance of **Kristina Ishmael**, Deputy Director of the Office of Educational Technology (OET) at the U.S. Department of Education. Within the OET, technical assistance was provided by **Bernadette Adams, Jodie Lawrence, Kevin Johnstun, Eric Gorner, David Spicer, Chelsea Blankenship**, and **Myriam Allred**.

Ji Soo Song, Jessica Ch'ng, and Hali Larkins served as the principal project team who designed and executed the DEER initiative.

Support for the creation of this document was provided by Digital Promise Global, led by **Merijke Coenraad** and **Zohal Shah**.

Listening Session Participants

In addition, we would like to thank the community leaders who participated in the listening sessions that informed the development of *Advancing Digital Equity for All: Community-Based Recommendations for Developing Effective Digital Equity Plans to Close the Digital Divide and Enable Technology-Empowered Learning*. These conversations provided invaluable insight into the evolving barriers to digital equity and promising strategies to overcome them.