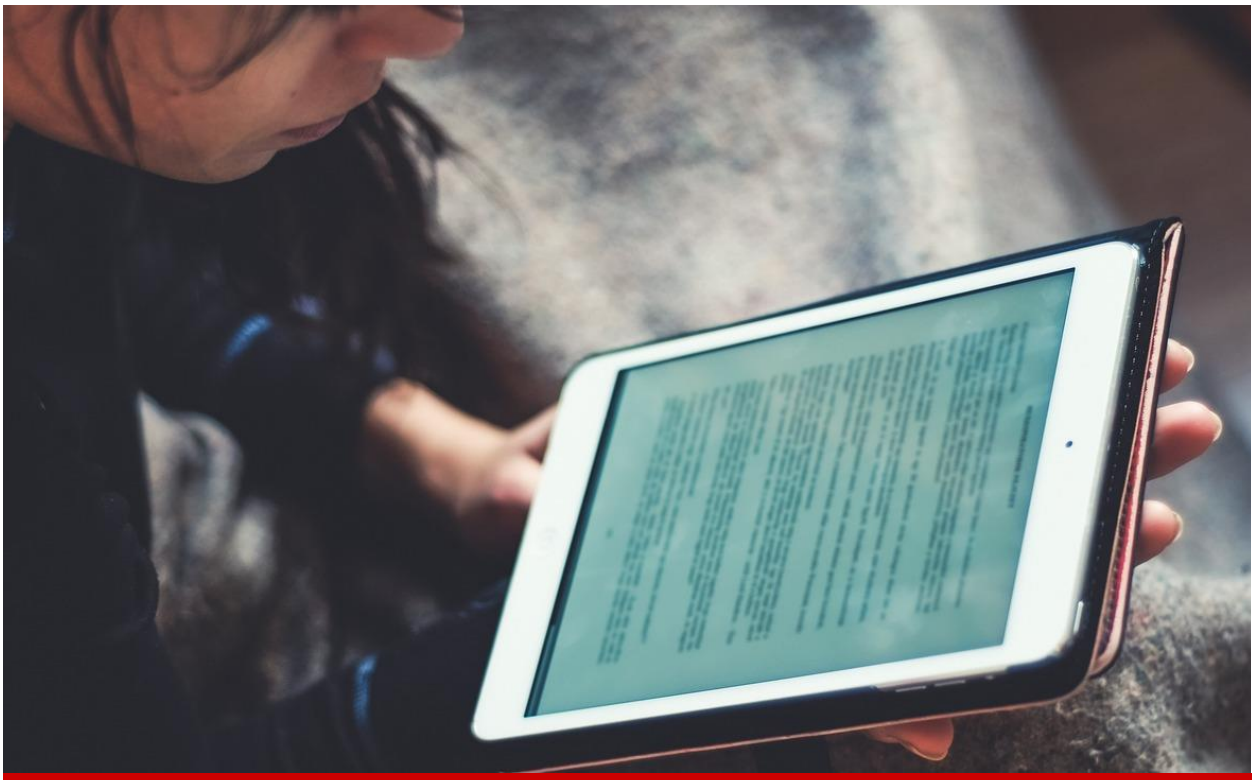


Digital Literacy and Equity

Key Concepts and Best Practices

May 2023

The William and Ida Friday Institute for Educational Innovation
North Carolina State University
Raleigh, NC

NC STATE
College of Education
Friday Institute
for Educational Innovation

NCCentral
UNIVERSITY
School of Library and
Information Sciences

THE DUKE ENDOWMENT

Table of Contents

Background

The COVID-19 pandemic increased awareness about the digital divide due to the number of vital services provided via the internet, pushing efforts to bridge the digital divide to the top of the policy agenda at the federal, state, and municipal levels. Government efforts to address this gap include the Elementary and Secondary School Emergency Relief (ESSER) funds (at the federal level) and the Building a New Digital Economy (BAND-NC) Grant (in North Carolina), which funds local digital inclusion projects that meet specific community needs for internet connections and devices (Institute for Emerging Issues, 2023). However, digital connection for all is merely a first-level goal in the process of achieving digital equity; connecting households is not enough (Ogbo et.al, 2020). Recipients of broadband subsidies or those who connect to the internet in public spaces often have limited experience using the internet and devices and have low digital literacy skills. This next level barrier, limited digital literacy, requires funding for a different type of effort which will hinge on connecting with those in need, identifying their respective needs, and providing support until they can operate independently as digital citizens.

Key Terminologies

Projects involving digital literacy and equity projects can be strengthened by clearly defining key terminologies that are used to describe problems and/or solutions. Though there is some variation in definitions of each from different credible and reliable sources, project leaders can ensure alignment of their own goals and outcomes (and in relation to broader efforts) by selecting and using definitions from the outset.

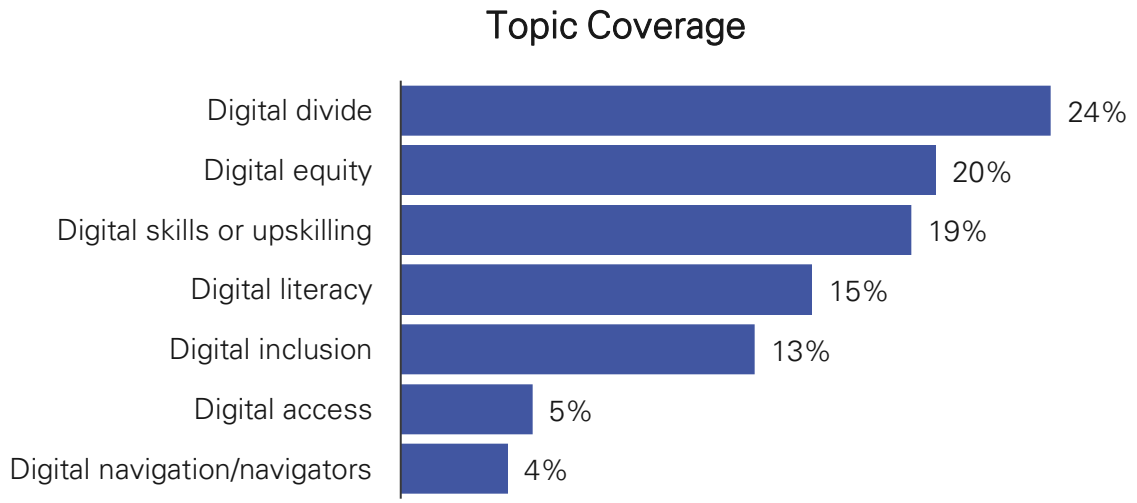
Some common terms with recommended definitions include the following:

- Digital literacy refers to skills for locating and using digital information in ways that utilize critical thinking to determine the value of resources. Digitally literate citizens operate digital tools with flexibility to create, collaborate, and communicate with others (ALA Literacy Clearinghouse, 2023).
- Digital equity is a desired condition in which all individuals have capacity for full participation in society through digital means, which are embedded in daily life processes. Digital equity is necessary for all means of participation, employment, learning, and access to other essential services (NDIA, 2023)
- Digital inclusion refers to the activities to which all individuals, including the most disadvantaged, should have access to through information technologies: affordable and adequate broadband internet, devices that meet their needs, access to digital skills training, effective technical support, and content for the devices which allows self-sufficiency (NDIA, 2023).
- Digital skills could refer to a range of simple to complex skills needed for operating digital tools in different contexts. For the purpose of addressing digital equity and literacy, they may be more clearly defined by adding the word "foundation". Digital foundation skills include but are not limited to the ability to turn on and control a device, connect devices to the internet, use a browser to find websites, and manage passwords (Department for Education, 2019).
- Digital upskilling involves improving an individual's digital skills in any context but is often used in the context of job acquisition or improvement. Working in a constantly

changing digital landscape requires adoption or adaptation of digital skills. Digital upskilling includes supporting employees or potential employees to gain the needed digital tools, skills, knowledge, and confidence to thrive in a digital workplace. (Upskill Digital, 2023).

- A **Digital navigator** is a trusted guide capable of helping individuals in need of support using digital technologies. They work to support the entire digital inclusion process (accessing high-speed internet at home, accessing reliable devices, and gaining digital skills) through repeated interactions with community members. The navigator might assist with locating and securing internet access or devices, troubleshooting common problems, and/or finding further technical support (NDIA, 2023).
- **Covered populations** are underrepresented communities and populations as defined by the Digital Equity Act of 2021 and includes: low-income families, aging individuals, incarcerated individuals, veterans, people with disabilities, English learners, people with low literacy, racial and ethnic minorities, and rural populations (Digital Equity Act Sec. 60302(8), 2021). These populations will be the focus of North Carolina's efforts to develop the state's Digital Equity Plan (NC DIT, 2023).

Figure 1: Frequency of topics covered in the literature and resources consulted for this project.



Measures of Success

Existing research has shown the benefits of broadband adoption, however, the effect of digital equity programs on eligible individuals and their communities - who are often economically disadvantaged - is understudied. Researchers and policymakers have highlighted the need for evaluating how well digital equity programs meet their objectives. Evidence of the success of digital literacy and equity programs draws on data from different sources such as surveys, program data (such as the number connected to the internet, provided access, success with increased skills), participant profiles, and interviews.

The measures of program success can be categorized into:

- Outputs. Several studies evaluated digital literacy programs by analyzing the direct products such as the number of participants enrolled, participants that complete the training, devices given out or subsidized, and subsidized broadband connections.

- Outcomes. A large and growing body of literature examines short- and medium-term effects including increased confidence in digital skills (Katz et. al., 2017; Prison Scholars Fund, 2023), interest in further training (Toha Tohara et. al., 2021), employment/job placement (Digital Works, 2021), increased internet use including social media use (Yu et. al., 2015), and telehealth (Dang et. al., 2022; Eruchalu et al., 2021).

  Impacts. The long-term effects of digital literacy and equity programs on the recipients and their communities remain briefly addressed in the literature. A handful of studies highlight the positive impact on recidivism rates (Withers, E, et.al, 2015; Thaler et al., 2022). However, other measures such as economic development and improved health outcomes have received scant attention.

Best Practices

A key question among digital inclusion stakeholders is how can we design and implement effective and sustainable digital equity programs. The following best practices around the design, implementation, and evaluation of digital literacy and equity programs emerged from the systematic review of the literature and existing programs.

Partner with community-based organizations. Collaborating with community-based organizations, particularly during the planning and implementation phases is recommended. As trusted partners and community stakeholders, these organizations can help to (1) identify the needs of the covered populations and (2) organize targeted outreach utilizing appropriate approaches such as workshops, community fairs, social media, and traditional communication methods like radio, TV, and paper (Tinubu Ali & Herrera, 2020). Unsuccessful or lackluster results sometimes come from missing critical connections with the community by working from the outside in rather than finding the connections from within the group to begin to work outward.

Tailor programs to meet the needs of the covered population(s). Critical digital equity needs vary (and sometimes overlap) across covered populations. For example, job training skills for a digital workforce meets the needs of low-income populations (Horrigan, 2018), veterans (National Telecommunications and Information Administration, 2013), and incarcerated individuals (Prison Scholars Fund, 2023), while those with low literacy and the aging populations benefit more from individualized instruction that focuses on basic computing skills (Lee & Kim, 2019). Several lines of evidence suggest that an expanded, yet tailored curriculum leads to improved outcomes (Lyons et al., 2019). Therefore, these programs could benefit from allowing families/individuals to customize their digital equity services based on their needs (Katz & Levine, 2015).

Utilize near-peer or family mentoring to help with building confidence with digital tools. Researchers highlight the value of near-peer and family mentoring as the most effective for helping new users to build confidence with digital tools, especially for older users (Lee & Kim, 2019) and returning citizens (Ogbonnaya-Ogburu et al., 2019). For older users, social connectedness with both their peers and their families is a primary motivation to learn digital skills (Ma et al., 2020). While for returning citizens and incarcerated individuals, mentoring offers both a sense of connectedness and an opportunity to develop "soft skills" in addition to technical knowledge (Withers et al., 2015; Thaler et al., 2022). Similarly, research on digital navigator programs found that participants responded well to receiving individualized technical training and support from members of their community, especially when provided in their native language (Kalmus et al., 2022).

Focus on practical applications of digital skills. We need to design engaging and sustainable programs that teach practical skills such as how to connect to essential services, pay bills, resolve consumer issues, etc. As technology advances and services/resources move online, internet access and the ability to successfully navigate the internet have become essential skills (Fernández-Muñoz et al., 2021; Lai & Widmar, 2021). While the younger generation has been deemed "digital natives", research indicates that a significant portion of this population lacks the necessary digital literacy/skills to succeed in college (Hiller, 2022) and/or the digital economy (Bergson-Shilcock, 2020).

Provide participant incentives. Providing participant incentives is recommended to increase participation and completion rates in digital literacy training (Bergson-Shilcock, 2020). Three categories of participant incentives emerged from the literature. First, it is well established from many studies that the unconnected population usually faces multiple digital equity barriers, such as low digital literacy, lack of access, and affordability (Horrigan, 2010; Gleason & Suen, 2021) which affects their ability to participate in - or benefit from - existing digital inclusion programs. Therefore, building incentives into programs that address multiple barriers is recommended, such as free internet access or hotspots to participants enrolled in digital literacy classes. Second, these incentives can also address broader contextual/socioeconomic challenges. It's important to note that these challenges may vary across groups; hence the incentives should be specific to the covered populations. For example, women and low-income households are more likely to be burdened with family/financial responsibilities (Davaki, 2018; Mulyaningsih et. al. 2020) that could affect their ability to participate in digital literacy training. Offering childcare or meals at training sessions could mitigate this challenge. Third, incentives ought to support participants' medium to long-term goals. For example, the ability to earn a certificate after completing the digital literacy training is recommended to improve completion rates, particularly among those seeking employment or continuing education (Seo et al., 2021).

Design inclusive programs. Digital equity efforts need to close the gap between groups. Evidence from the research indicates that some covered populations are represented more than others. Those with low incomes are most often targeted by digital equity work, followed by racial and ethnic minorities and those who live in rural areas. The other covered populations (listed above in definitions) would benefit from more attention. Programs can also be designed for inclusivity by prioritizing accessibility. Planners need to be aware of ADA compliance when providing devices and utilizing software, be prepared to provide translation services, etc. For example, Khanlou, et al. (2020) addressed the importance of digital inclusion for young adults

with developmental disabilities while Eruchalu, et al. (2021) stressed the need for "culturally and linguistically inclusive digital health platforms" (p. 185). Also, there are groups which may need targeted support but are not included in the covered populations. For example, females and women often have unique needs, as well as those that fall just outside the eligible poverty line, the unemployed, refugees, single parent households, and LGBTQIA populations (Pérez-Escolar & Canet, 2022; Washington State Department of Veterans Affairs. (n.d.)).

Conclusion

Work towards digital equity will continue to be needed well into the future, and the issues underlying the needs complicate efforts to connect with the covered populations and maintain support. It can take enormous effort to reach people who cannot be connected digitally. While they are simple to do, knocking on doors, making phone calls, and placing or mailing flyers require additional people power which places budgets and workers under stress. During evaluation, what seems like a low number of participants at the end of a project may actually represent a lot of work. For this reason, it is recommended that evaluation efforts take a holistic view and include not just quantitative data, but qualitative data that tells a story of what was undertaken and how it influenced participants and providers.

About This Brief

This brief is part of a series of research products regarding digital equity and digital literacy. In addition to this brief, there is an annotated spreadsheet with 163 articles and resources from the last ten years focused on digital equity and literacy. Another brief was written about the covered populations, which can be found here. A concept map presenting key points from the research and links to the accompanying materials can be found at https://go.ncsu.edu/dedlmap. The work was commissioned by The NC Department of Information Technology (NCDIT) and the NC Office of Strategic Partnerships (OSP) and funded by the Duke Endowment.

The work was led by Program Evaluation and Education Research (PEER) team members Dr. Rebekah Davis and Erin Huggins. Consultation and collaboration were provided by Dr. Erezi Ogbo of North Carolina Central University. Enormous effort on the accompanying spreadsheet resources was headed by Doctoral Candidate Alin Yaclincaya and NCSU graduate student Samantha Duke. They were assisted by graduate research assistants Austin Gragson, Victoria Ardines, and Tanzimul Ferdous. Special thanks go to Dr. Cigdem Meral and Lindsay Hann for their assistance.

References

Bergson-Shilcock, A. (2020). The New Landscape of Digital Literacy: How Workers' Uneven Digital Skills Affect Economic Mobility and Business Competitiveness, and What Policymakers Can Do about It. National Skills Coalition. https://files.eric.ed.gov/fulltext/ED607391.pdf

Dang, S., Muralidhar, K., Li, S., Tang, F., Mintzer, M., Ruiz, J., & Willy, M. V. (2022). Gap in willingness and access to video visit use among older high-risk veterans: Cross-sectional study. *Journal of Medical Internet Research*, *24*(4), 1-15. https://doi.org/10.2196/32570

Davaki, K. (2018). The underlying causes of the digital gender gap and possible solutions for enhanced digital inclusion of women and girls.

Digital works. (2021). *Celebration of jobs*. Retrieved May 20, 2023. https://digitalworksjobs.org/celebration-of-jobs/

Eruchalu, C. N., Pichardo, M. S., Bharadwaj, M., Rodriguez, C. B., Rodriguez, J. A., Bergmark, R. W., Bates, D. W., & Ortega, G. (2021). The expanding digital divide: digital health access inequities during the COVID-19 pandemic in New York City. *Journal of Urban Health,* 98, 183-186. https://doi.org/10.1007/s11524-020-00508-9

Fernández-Muñoz, J., Kiptaş, D., & Lozano, J. (2021). How to Close the Digital Divide in the U.S. Harvard Business Review. https://hbr.org/2021/07/how-to-close-the-digital-divide-in-the-u-s

Gleason, K, Suen, JJ. (2021). Going beyond affordability for digital equity: Closing the "Digital Divide" through outreach and training programs for older adults. *Journal of the American Geriatrics Society*, 70(1): 75- 77. doi:10.1111/jgs.17511

Hiller, R. (2022). Combating Low Digital Literacy in the College Classroom: A Narrative Review. *Florida Journal of Educational Research*, *59*(3). Retrieved from https://journals.flvc.org/fjer/article/view/130541

Horrigan, J. B. (2010). Broadband Adoption and Use in America. OBI Working Paper Series No. 1. https://docs.fcc.gov/public/attachments/DOC-296442A1.pdf

Horrigan, J. B. (2018). Digital Skills and Job Training: Community-driven initiatives are leading the way in preparing Americans for today's jobs.

Kalmus, M., Hill, H., Lee, J., Goodchild, C., & Webb, D., (2022). How to Close Digital Divide with Human Approach. Retrieved from https://www.bcg.com/publications/2022/how-to-close-digital-divide-with-human-approach.

Katz, V. S., & Levine, M. H. (2015). Connecting to learn: Promoting Digital Equity for America's Hispanic families. https://joanganzcooneycenter.org/wp-content/uploads/2015/03/jgcc_connectingtolearn.pdf. Retrieved May 2, 2023, from https://joanganzcooneycenter.org/wp-content/uploads/2015/03/jgcc_connectingtolearn.pdf

Katz, V. S., Moran, M. B., & Ognyanova, K. (2017). Contextualizing connectivity: How internet connection type and parental factors influence technology use among lower-income children. *Information, Communication & Society*, 22(3), 313–335. https://doi.org/10.1080/1369118x.2017.1379551

Khanlou, N., Khan, A., Vazquez, L. M., & Zangeneh, M. (2020). Digital Literacy, access to technology and inclusion for young adults with developmental disabilities. *Journal of Developmental and Physical Disabilities*, 33(1), 1–25. https://doi.org/10.1007/s10882-020-09738-w

Lai, J., & Widmar, N. O. (2021). Revisiting the digital divide in the COVID-19 era. *Applied Economic Perspectives and Policy*, 43(1), 458-464.

Lee, O. E.-K., & Kim, D.-H. (2019). Bridging the Digital Divide for Older Adults via Intergenerational Mentor-Up. Research on Social Work Practice, 29(7), 786–795. https://doi.org/10.1177/1049731518810798

Lyons, A. C., Zucchetti, A., Kass-Hanna, J., & Cobo, C. (2019). Bridging the gap between digital skills and employability for vulnerable populations. In *The Digital Age*.

Ma, Q., Chan, A. H. S., & Teh, P.-L. (2020). Bridging the Digital Divide for Older Adults via Observational Training: Effects of Model Identity from a Generational Perspective. *Sustainability*, 12(11), 4555. https://doi.org/10.3390/su12114555

Mulyaningsih, T., Wahyunengseh, R., & Hastjarjo, S. (2021). Poverty and Digital Divide: A Study in Urban Poor Neighborhoods. *Jurnal Ilmu Sosial dan Ilmu Politik, 24*(2), 189-203. doi:http://dx.doi.org/10.22146/jsp.52325

National Telecommunications and Information Administration. (2013). Broadband Technology Opportunities Program Evaluation Study (Order No. D10PD18645). Retrieved from https://www.ntia.gov/files/ntia/blogimages/workforce_west_virginia_case_study_report_round_2.pdf

Ogbo, E., Brown, T., Gant, J., & Sicker, D. (2020). When being connected is not enough. an analysis of the second and third levels of the digital divide in a developing country. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3749699

Ogbonnaya-Ogburu, I. F., Toyama, K., & Dillahunt, T. R. (2019, May). Towards an effective digital literacy intervention to assist returning citizens with job search. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1-12).

Pérez-Escolar, M., & Canet, F. (2022). Research on vulnerable people and Digital Inclusion: Toward a consolidated taxonomical framework. *Universal Access in the Information Society*. https://doi.org/10.1007/s10209-022-00867-x

Prison Scholars Fund. (2023). *Our work and impact*. https://www.prisonscholars.org/what-we-do/our-work-impact/

Seo, H., Altschwager, D., Choi, B-Y., Song, S., Britton, H., Ramaswamy, M., Schuster, B., Ault, M., Ayinala, K., Zaman, R., Tihen, B., & Yenugu, L. (2021). Informal technology education for women transitioning from incarceration. ACM *Transactions on Computing Education*, 21(2), 1-16. Doi: https://doi.org/10.1145/3425711

Thaler, O., Barkworth, J., & Howard, M. (2022) Implementing digital technologies in prisons: A qualitative study of inmate experiences. Corrections Research Evaluation and Statistics. Corrective Services NSW, Research Bulletin No. 5.

Tinubu Ali, T., & Herrera, M. (2020). Distance learning during COVID-19: 7 equity considerations for schools and districts. Southern Education Foundation. Retrieved April 28, 2023. https://southerneducation.org/publications/covid-19-digital-equity/.

Toha Tohara, A. J., Shuhidan, S. M., Saiful Bahry, F. D., & bin Nordin, M. N. (2021, April). Exploring Digital Literacy Strategies for students with special educational needs in the Digital age. Turkish Journal of Computer and Mathematics Education (TURCOMAT). Retrieved April 28, 2023, from https://turcomat.org/index.php/turkbilmat/article/view/5741

Washington State Department of Veterans Affairs. (n.d.). Digital navigator program. https://www.dva.wa.gov/veterans-service-members-and-their-families/digital-navigator-program

Withers, E., Jacobs, G., Castek, J., Pizzolato, D., Pendell, K., & Reder S. (2015). Corrections and reentry. Digital literacy acquisition case study. http://archives.pdx.edu/ds/psu/16519

Yu, R. P., Ellison, N. B., McCammon, R. J., & Langa, K. M. (2015). Mapping the two levels of digital divide: Internet access and Social Network site adoption among older adults in the USA. *Information, Communication & Society*, 19(10), 1445–1464. https://doi.org/10.1080/1369118x.2015.1109695