

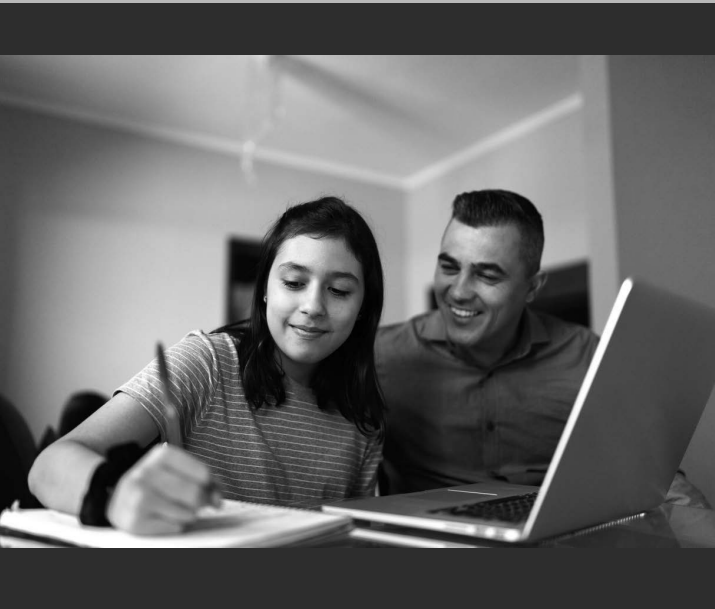


Forum Guide to Digital Equity





Forum Guide to Digital Equity





National Cooperative Education Statistics System

The National Center for Education Statistics (NCES) established the National Cooperative Education Statistics System (Cooperative System) to assist in producing and maintaining comparable and uniform information and data on early childhood, elementary, and secondary education. These data are intended to be useful for policymaking at the federal, state, and local levels.

The National Forum on Education Statistics (Forum) is an entity of the Cooperative System and, among its other activities, proposes principles of good practice to assist state and local education agencies (SEAs and LEAs) in meeting this purpose. The Cooperative System and the Forum are supported in these endeavors by resources from NCES.

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Foreword

The Forum is pleased to present the *Forum Guide to Digital Equity*. The purpose of this document is to help education agencies close digital equity gaps by collecting comparable data, using those data to provide devices and sufficient access to the Internet to students, and collaborating with stakeholders, including families, government agencies, organizations, public and private partners, and others.

Digital inequity has been a long-standing issue in the education community. A lack of home internet and technology devices can not only hinder students' ability to access educational resources at home, but can also have a detrimental effect on student achievement. Education agencies have taken steps over the past decades to address digital inequity by providing internet access in schools and implementing 1:1 device programs. Schools have also provided internet access outside of schools in various ways through community partners, public Wi-Fi, and, more recently, through various programs that provide home internet access. This resource provides recommendations that will help agencies collect and use digital equity data and reflects lessons learned by the education data community during the coronavirus disease (COVID-19) pandemic.

This document focuses on digital equity, with a specific emphasis on data, from the perspective of the education data community. This resource is not intended as a comprehensive guide to digital equity, and not all aspects of digital equity are addressed. Rather, this document focuses on the collection of data and the ways these data can be used to achieve digital equity.

Publication Objectives

This resource aims to help agencies

- understand digital equity and the impact of equity and inequity in education;
- have comparable, high-quality digital equity data for data-informed decision-making;
- use those data to identify issues, prioritize action, and create new programs or sustain existing digital equity efforts;
- develop digital equity tools for SEAs and LEAs; and
- close digital equity gaps.

Intended Audience

The primary audience for this publication includes staff in federal, state, and local education agencies whose responsibilities include any aspect of collecting, reporting, analyzing, or using data on student and staff access to the Internet and technology devices. This audience includes program and data staff, researchers, administrators, policymakers, and others who are tasked with using data to close digital equity gaps.

Organization of This Resource

This resource includes the following chapters and appendices:

- **Chapter 1** defines the concept of digital equity and discusses the importance of digital equity for all education stakeholders.
- **Chapter 2** identifies common categories of digital equity data and describes the different ways that SEAs and LEAs are collecting quality digital equity data.
- **Chapter 3** discusses how agencies are using data to identify issues, prioritize action, and close digital equity gaps.
- **Chapter 4** features case studies from education agencies about their use of digital equity data, challenges experienced, and lessons learned.

- **Appendix A** contains a sample list of digital equity resources developed by federal, state, and local agencies, as well as organizations.
- **Appendix B** lists sample questions that could be included in a digital equity survey.
- **Appendix C** provides resources for conducting a digital equity audit.

National Forum on Education Statistics

The work of the Forum is a key aspect of the Cooperative System. The Cooperative System was established to produce and maintain, with the cooperation of the states, comparable and uniform education information and data that are useful for policymaking at the federal, state, and local levels. To assist in meeting this goal, NCES within IES—a part of ED—established the Forum to improve the collection, reporting, and use of elementary and secondary education statistics. The Forum includes approximately 120 representatives from SEAs and LEAs, the federal government, and other organizations with an interest in education data. The Forum deals with issues in education data policy, sponsors innovations in data collection and reporting, and provides technical assistance to improve state and local data systems.

Development of Forum Products

Members of the Forum establish working groups to develop guides in data-related areas of interest to federal, state, and local education agencies. They are assisted in this work by NCES, but the content comes from the collective experience of working group members who review all products iteratively throughout the development process. After the working group completes the content and reviews the document a final time, the publication is subject to examination by members of the Forum standing committee that sponsors the project. Finally, Forum members review and formally vote to approve all documents before publication. NCES provides final review and approval before online publication. The information and opinions published in Forum products do not necessarily represent the policies or views of ED, IES, or NCES. Readers may modify, customize, or reproduce any or all parts of this document.



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This online publication was developed through the Cooperative System and funded by NCES within IES—a part of ED. The Digital Equity Working Group of the Forum is responsible for the content.

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Glossary of Common Terms

Accessibility. When persons with different abilities are provided with equal opportunity to the physical tools and virtual environments needed to acquire the same information, visit the same places, engage in the same interactions, and enjoy the same services as persons without different abilities. Accessibility ensures that students with different abilities have an equal opportunity to receive the educational benefits and possibilities afforded by education technology, as well as equal treatment in the use of such technology.

Affordability. The ability to pay the cost of high-speed, reliable internet connectivity.

Asynchronous pacing. Virtual course sections that consist of student-oriented teaching and learning which is not organized around participants interacting at the same time and in the same virtual space. These sections may be self-paced, in which students access course section instruction and materials, and complete assignments at their convenience by agreed-upon deadlines.¹

Broadband. Broadband provides high-speed internet access via multiple types of technologies, including fiber optics, wireless, cable, DSL, and satellite.² The 2021 Infrastructure Investment and Jobs Act increased broadband internet speed benchmarks to 100 megabits per second (Mbps) for downloads and 20 Mbps per second for uploads.

Cellular network. Also known as a mobile network, a communication network where the link to and from end nodes is wireless.

Community-provided Wi-Fi. Wireless access points set up in public locations within a community that provide free internet access within a certain radius.³

Cyberbullying/harassment. A form of unwanted, aggressive behavior among school-age children that involves a real or perceived power imbalance and that is repeated, or has the potential to be repeated, over time using electronic devices, such as cell phones, computers, and tablets, or other communication tools, including social media sites, text messages, chat rooms, and websites.⁴

Devices. Digital devices that can be used to access the Internet, including, but not limited to, desktop computers, laptop computers, tablets, netbook computers, notebook computers, handheld computers, and smartphones.

Dial-up. An internet connection from a computer that goes through a regular telephone line, in which special communications software instructs a modem to dial a number to access another computer system or a network.⁵

1 National Forum on Education Statistics. (2021). *Forum Guide to Virtual Education Data: A Resource for Education Agencies* (NFES 2021078). U.S. Department of Education. Retrieved on February 17, 2022, from https://nces.ed.gov/forum/pub_2021078.asp.

2 U.S. Department of Education, Office for Education Technology. (June 2021). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home*. Retrieved October 29, 2021, from <https://tech.ed.gov/wireless-brief/>.

3 U.S. Department of Education, Office for Education Technology. (June 2021). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home*. Retrieved October 29, 2021, from <https://tech.ed.gov/wireless-brief/>.

4 U.S. Department of Education, Office of Safe and Supportive Schools, National Center on Safe Supportive Learning Environments. (n.d.). *Bullying/Cyberbullying*. Retrieved on February 17, 2022, from <https://safesupportivelearning.ed.gov/topic-research/safety/bullyingcyberbullying>.

5 U.S. Department of Education, Office for Education Technology. (June 2021). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home*. Retrieved October 29, 2021, from <https://tech.ed.gov/wireless-brief/>.

Digital equity. The condition in which individuals and communities have the information technology (IT) capacity that is needed for full participation in the society and economy of the United States.⁶ Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services.⁷

Digital literacy. The necessary skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information.⁸

Digital native. A person who is born or brought up during the age of digital technology and is familiar with the Internet at an early age. Being a digital native does not necessarily make a person more digitally literate.

Infrastructure. The structures, facilities, and equipment for internet and broadband infrastructure, buildings and real property, electrical transmission facilities and systems, and utilities.

Learning management system (LMS). A system that is used to organize, store, and share instruction and online or digital resources.

Megabits per second (Mbps). The standard measure that refers to the speed with which information packets are downloaded from, or uploaded to, the Internet.⁹

Mobile hotspot. Mobile or portable hotspot uses a cellular data connection to connect or “tether” a device to the Internet.¹⁰

1:1 program. A program that provides every student with a standard device (such as a laptop or tablet) for educational use. 1:1 programs are structured differently depending on agency policies; some policies only allow devices to be used on school campuses, while others allow students to take the device home for use outside of school.

Privacy. Adherence to the legal and ethical requirements for protecting the confidentiality of data.¹¹

Remote education. Instruction during which students, teachers, or instructional staff are separated by time or location, or both, temporarily or for a limited time. This scenario may be implemented during temporary emergencies, such as a public health crisis or natural disaster, that limit the ability of students and/or staff to safely participate in in-person education.¹²

Satellite internet. The use of satellites orbiting the earth to provide internet service.¹³

6 Infrastructure Investment and Jobs Act of 2021, 47 U.S.C. § 1751-52 et seq. (2022)

7 U.S. Department of Education, Office for Education Technology. (June 2021). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home*. Retrieved October 29, 2021, from <https://tech.ed.gov/wireless-brief/>.

8 Infrastructure Investment and Jobs Act of 2021, 47 U.S.C. § 1751-52 et seq. (2022)

9 Federal Communications Commission. (February 2020). *Household Broadband Guide*. Retrieved February 17, 2022, from <https://www.fcc.gov/consumers/guides/household-broadband-guide>.

10 U.S. Department of Education, Office for Education Technology. (June 2021). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home*. Retrieved October 29, 2021, from <https://tech.ed.gov/wireless-brief/>.

11 National Forum on Education Statistics. (2016). *Forum Guide to Education Data Privacy* (NFES 2016-096). U.S. Department of Education. Retrieved on February 18, 2022, from https://nces.ed.gov/forum/pub_2016096.asp.

12 National Forum on Education Statistics. (2021). *Forum Guide to Virtual Education Data: A Resource for Education Agencies* (NFES 2021078). U.S. Department of Education. Retrieved on February 17, 2022, from https://nces.ed.gov/forum/pub_2021078.asp.

13 U.S. Department of Education, Office for Education Technology. (June 2017). *Building Technology Infrastructure for Learning*. Retrieved February 18, 2022, from <https://tech.ed.gov/infrastructure/>.

Security. Implementation of the technical aspects of protecting data within information technology infrastructure and user applications and tools.¹⁴

Social-emotional learning (SEL). The processes through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions.¹⁵

Synchronous pacing. Virtual course sections that consist of group-oriented teaching and learning organized around participants interacting at the same time and in the same virtual space. In these courses, content is taught to a group of students who log in, tune in, or otherwise participate at a specified time and learn at the same time, as in a traditional course section, but without a shared physical presence.¹⁶

Technology integration. The incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools.¹⁷

Virtual education. Instruction during which students and teachers are separated by time or location, or both, and interact via internet-connected computers, tablets, or other electronic devices.¹⁸

Wi-Fi hotspots. Physical locations where people can wirelessly connect a device to the Internet using Wi-Fi via a wireless local area network.¹⁹

14 National Forum on Education Statistics. (2016). *Forum Guide to Education Data Privacy* (NFES 2016-096). U.S. Department of Education. Retrieved on February 18, 2022, from https://nces.ed.gov/forum/pub_2016096.asp.

15 U.S. Department of Education, Office of Safe and Supportive Schools, National Center on Safe Supportive Learning Environments. (n.d.). *Social Emotional Learning*. Retrieved on February 18, 2022, from <https://safesupportivelearning.ed.gov/hot-topics/social-emotional-learning>.

16 National Forum on Education Statistics. (2021). *Forum Guide to Virtual Education Data: A Resource for Education Agencies* (NFES 2021078). U.S. Department of Education. Retrieved on February 17, 2022, from https://nces.ed.gov/forum/pub_2021078.asp.

17 National Forum on Education Statistics. (2002). *Technology in Schools. Suggestions, Tools and Guidelines for Assessing Technology in Elementary and Secondary Education* (NCES 2003313). U.S. Department of Education. Retrieved on February 18, 2022, from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2003313>.

18 National Forum on Education Statistics. (2021). *Forum Guide to Virtual Education Data: A Resource for Education Agencies* (NFES 2021078). U.S. Department of Education. Retrieved on February 17, 2022, from https://nces.ed.gov/forum/pub_2021078.asp.

19 U.S. Department of Education, Office for Education Technology. (June 2021). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home*. Retrieved October 29, 2021, from <https://tech.ed.gov/wireless-brief/>.

Chapter One: Introduction

What is Digital Equity?

Digital equity is the condition in which individuals and communities have the information technology (IT) capacity that is needed for full participation in the society and economy of the United States.²⁰ Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services.²¹

The current state of digital equity is fluid due to both rapid changes in technology and how people can access and use these technologies. Digital equity is not achieved solely by providing access to the Internet, devices,²² and information; internet connectivity needs to be fast enough and devices need to be robust enough to support full participation in social, educational, economic, and civic activities. Furthermore, even the fastest internet service and device performance will not achieve digital equity without digital literacy skills. Digital literacy refers to the necessary skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information.²³ Digital literacy is essential for teaching and learning and requires cognitive, technical, and critical thinking skills.²⁴ In the classroom, digital equity involves allowing every student to learn from digitally literate teachers who understand how to use technology to both enhance learning and create quality learning experiences for all students, including those with special needs.

Why Digital Equity Matters

Digital inequity has been a long-standing issue in the education community. Education agencies have taken steps over the past decades to address digital inequity by providing internet access in schools and implementing 1:1 device programs. Schools have also provided internet access outside of schools in various ways through community partners, public Wi-Fi, and, more recently, through various programs that provide home internet access. However, barriers to digital equity persist:

20 Infrastructure Investment and Jobs Act of 2021, 47 U.S.C. § 1751-52 et seq. (2022)

21 U.S. Department of Education, Office for Education Technology. (June 2021). *Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home*. Retrieved October 29, 2021, from <https://tech.ed.gov/wireless-brief/>.

22 Digital devices that can be used to access an internet connection, including, but not limited to, desktop computers, laptop computers, tablets, netbook computers, notebook computers, handheld computers, and smartphones.

23 Infrastructure Investment and Jobs Act of 2021, 47 U.S.C. § 1751-52 et seq. (2022)

24 American Library Association. (2021). *Digital Literacy*. Retrieved November 18, 2021, from <https://literacy.ala.org/digital-literacy/>.

- Household Finances—Some households do not have the financial resources to purchase devices or internet access.
- Inaccessibility—When persons with different abilities are not provided with equal opportunity to the physical tools and virtual environments needed to acquire the same information, visit the same places, engage in the same interactions, and enjoy the same services as persons without different abilities. Inaccessibility occurs when students with different abilities do not have an equal opportunity to receive the educational benefits and possibilities afforded by education technology, as well as equal treatment in the use of such technology.
- Inadequate Devices—Households that have multiple internet-connected smartphones may lack a computing device (such as a desktop computer, laptop, or tablet) that can adequately support student access to educational resources.
- Infrastructure Challenges— Some households have building materials, such as metal and concrete, that inhibit Wi-Fi signals. Location can also pose a barrier; some households are located in areas without the necessary infrastructure to obtain high-speed internet access or where access is cost-prohibitive to provide, while households within the National Radio Quiet Zone are restricted in their use of Wi-Fi.
- Inexperience—Limited technology resources and training for teachers can limit the adoption of technology and incorporation of digital learning experiences in the classroom. Parents, caregivers, and students with limited knowledge of how to work a computer, connect to a network, navigate websites, and access a learning management system (LMS) also pose a barrier, especially for younger students (K-2) who rely on caregivers for assistance.
- Insufficient Support and Training—Stakeholders who lack access to training and basic support, including a lack of IT support for families and a lack of focus on equity in teacher preparation and administrative leadership programs, will not be able to fully benefit from digital equity efforts.
- Language and Culture— Information, technology, and resources that are only available in English, such as a lack of translation services for English learners (ELs) or English-only IT support, pose a barrier.
- Oversaturation—Households that have multiple internet-connected devices, or neighborhoods where internet use exceeds that which can be adequately supported by providers, may lack the necessary saturation/bandwidth to maintain consistent high-speed access.
- Personal Choice—Some families choose not to use digital devices or be connected to the Internet.
- Security and Privacy Threats—Concerns over online safety, cyberbullying, and data collections can sometimes limit the adoption of digital equity solutions.
- Shared Devices—Households with more than one student often require multiple

Bridging Language Barriers

- The Bozeman School District #7 (MT) website (<https://www.bsd7.org/>) has a translation feature with different language options. The district's programs used for online learning are also available in multiple languages.
- The Jonesboro Public Schools (AR) website (<https://www.jonesboroschools.net/>) includes a translation feature with over 100 language options.
- Noblesville Schools (IN) has a full-time English learner (EL) liaison staff member whose job is to help families who are experiencing language barriers.

computing devices to accommodate student access to virtual learning resources. Student access to devices can also be impacted when parents require the use of a common household device to work from home.

- Slow Internet Speeds—Households that use hotspots, dial-up, or mobile connections to the Internet may not have the adequate speed to access tools and platforms, such as videoconferencing software that requires high-speed internet use. Relatedly, some home networks are configured to efficiently download data but are not configured to upload data at similar speeds, which is necessary for participating in video calls and conferences.
- Weather-related Outages—Severe weather events and storms can impact utilities and internet infrastructure, resulting in prolonged outages lasting weeks or months. Rural communities with limited connectivity and infrastructural capacity are particularly vulnerable to prolonged outages.

As more information, processes, and systems are made available online, a lack of access can prevent those who are seeking to join the education system from easily doing so. For example, a fully online student enrollment system cannot be easily accessed by families without internet access or computing devices at home. In the same way, an online job application system can pose a barrier to prospective employees who wish to apply for a job within the agency but lack the digital means to do so. Digital equity is important for all education stakeholders:

- Students—As schools have increasingly integrated online learning activities into coursework, students need access outside of school to continue their lessons, research, and homework. A lack of home internet and technology devices may not only hinder students' ability to access educational resources at home but also may have a detrimental effect on student achievement.²⁵ Inequitable access can prevent students from continuing their learning outside of the school day, thus increasing the achievement gap. In addition to having an immediate impact on student achievement, digital inequity can have a long-term impact and exacerbate already stark disparities in outcomes. Adults who are not digitally literate have lower labor force participation rates and tend to work in lower-skilled jobs than digitally literate adults.²⁶
- Instructional Staff—Teachers, substitutes, and teaching assistants need devices, connectivity, and fluency with digital tools to deliver instruction, hold office hours, engage in professional development (PD), and connect with students, administrators, and parents virtually.
- Non-Instructional Staff—Counselors, social workers, student social and emotional support personnel, unified mental health teams, and others need to communicate and collaborate with students and families virtually to check on students or help them with counseling, mentoring, tutoring, college applications, financial aid completion, or other needs. State and local education agency (SEA and LEA) staff who work remotely, especially during public health emergencies or other crises, also need the hardware and internet connection necessary to perform their work duties.

25 National Assessment of Educational Progress. (n.d.). *2015 Survey Questionnaires Results: Students' Computer Access and Use*. Retrieved August 31, 2021, from https://www.nationsreportcard.gov/sq_computer/.

26 U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. (May 2018). *A Description of U.S. Adults Who Are Not Digitally Literate*. Retrieved December 27, 2021, from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2018161>.

- Leadership—Administrators need to be able to communicate with families and staff and connect virtually with third parties (such as vendors or other providers of school services).
- Agencies—SEAs and LEAs need to be able to communicate internally with staff and externally with stakeholders.
- Families—Parents, guardians, and caregivers need digital skills to support virtual and remote learning and homework. They also need to be able to participate in virtual parent-teacher conferences and access services for their children, such as mental health support and social-emotional learning (SEL) resources. Communication with families who do not have access to technology such as email, a cellphone, or a computer is also more difficult.
- Community Members—The public needs to be able to participate in virtual school board meetings and other digital means of educational decision-making, such as online surveys.
- Preservice Teacher Education—Future educators need to be equipped with the digital knowledge, skills, and abilities that will help them and their future students succeed in the classroom.

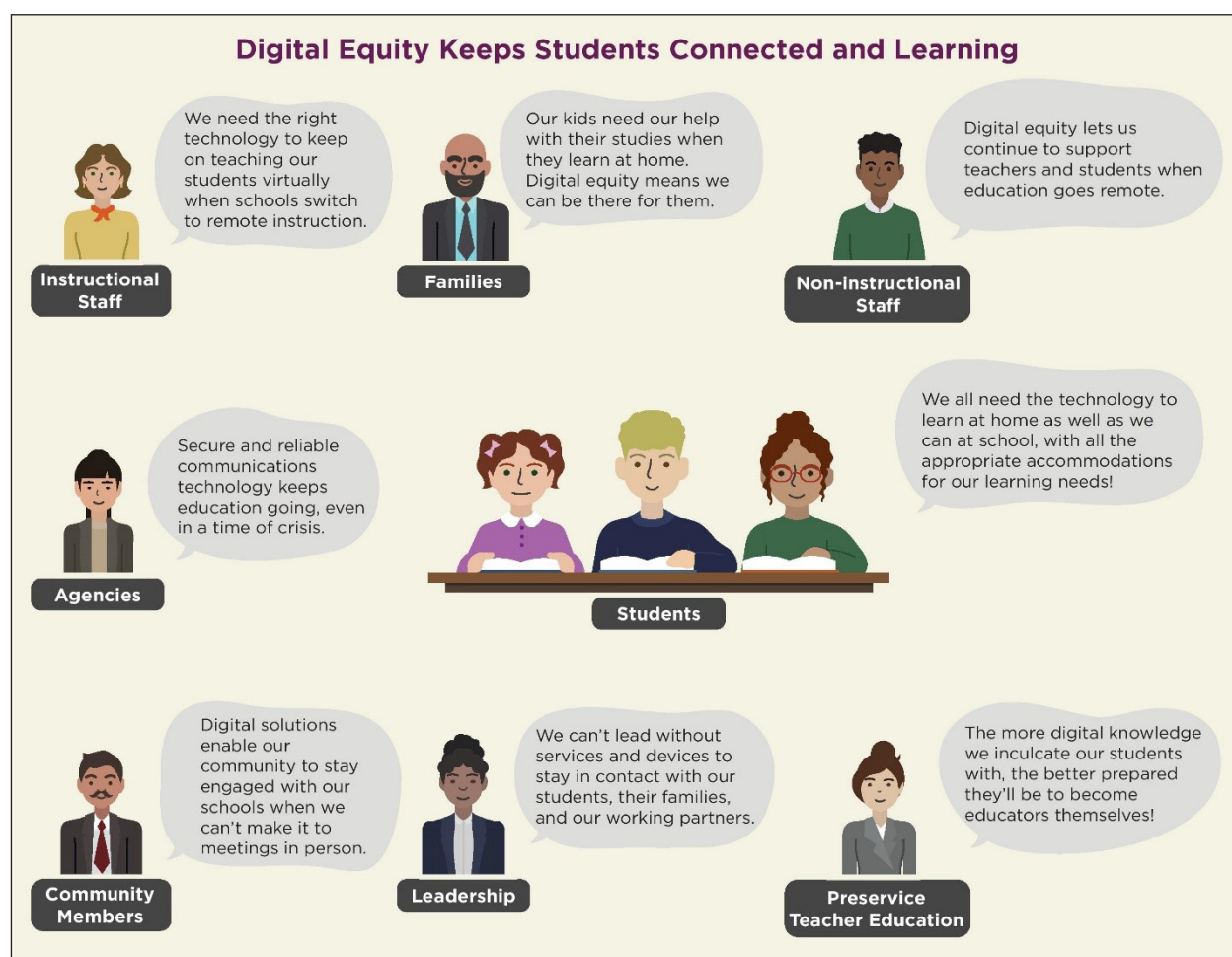


Figure 1: Even if they do not work with students directly, digital equity enables many stakeholders to play a role in supporting student learning.

Flexible teaching and learning models necessitate access to curricula beyond traditional school hours. This is important for academic progression, as well as students' SEL. Students and teachers need access to both devices and the Internet to participate in virtual education—one without the other is not sufficient. For example, the use of online or remote education when physical school buildings are closed because of natural disasters or public health emergencies raises questions of equity. If agencies substitute inclement weather days with online learning days, students and teachers who do not have access to a dedicated learning device and high-speed internet connectivity at home could be at a disadvantage. Staff may also need accommodations to work from home, and some agencies provide devices and internet access to staff who need it. Digital equity also expands access to online courses for students from smaller districts that may not have the capacity for advanced classes or curricular breadth.

The Current State of Digital Equity

The coronavirus disease (COVID-19) pandemic further exacerbated the already broad gap between those who have adequate access to computing devices and the Internet and those who do not. The widespread adoption of remote education during the pandemic, coupled with the move to digital content by publishers at a time when many students are digitally native, made it increasingly important for agencies to address digital equity so that all students could receive an education. Virtual and remote learning during inclement weather and natural

disasters, such as snow days, tornadoes, and hurricanes, has become more common. In some districts, students have historically been allowed to enroll in virtual sections of a dual-credit course offered at another high school in their district. The adoption of alternate modes of instruction during the pandemic has motivated more districts to expand access to these types of course offerings.

Data collected during the COVID-19 pandemic show how digital equity has changed over time. In the first weeks of the COVID-19 pandemic, 88 percent of adults reported that computers were always or usually available to children for educational purposes, and 91 percent reported that internet access was always or usually available to children for educational purposes.²⁷ By September 2020, adults reported that student access had slightly improved: 91 percent reported that computers were always or usually available, and 93 percent reported that internet access was always or usually available.²⁸ While some progress had been made in the first 6 months of the pandemic, the gaps in student access to computers and the Internet remained a challenge.

In response to these persistent gaps, schools dedicated efforts to provide devices and internet connectivity to students who needed them. In September 2020, 59 percent of adults reported


Forum Guide to Virtual Education Data: A Resource for Education Agencies

https://nces.ed.gov/forum/pub_2021078.asp

This resource is designed to assist agencies with collecting data in virtual education settings, incorporating the data into governance processes and policies, and using the data to improve virtual education offerings. This resource reflects lessons learned by the education data community during the coronavirus disease (COVID-19) pandemic and provides recommendations that will help agencies collect and use virtual education data.

27 U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. (May 2021). *Impact of the Coronavirus Pandemic on the Elementary and Secondary Education System*. Retrieved November 19, 2021, from <https://nces.ed.gov/programs/coe/indicator/tcb>.

28 U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. (May 2021). *Impact of the Coronavirus Pandemic on the Elementary and Secondary Education System*. Retrieved November 19, 2021, from <https://nces.ed.gov/programs/coe/indicator/tcb>.



that their children’s school district or school provided a computer or device, but only 4 percent reported that internet access was paid for by the district or school.²⁹ By the following September, notable progress had been made to close digital equity gaps: 96 percent of schools reported issuing devices to students in need, and 70 percent provided in-home internet access to students without it. To connect students for whom in-home internet access was not feasible, 49 percent of schools provided internet access points at locations other than a student’s home.³⁰

Improved digital equity planning is needed going forward, as it will be important to solve equity and access issues when considering future education decisions. To help close the digital divide, the 2021 Infrastructure Investment and Jobs Act³¹ invests \$65 billion to help ensure that every American has access to reliable, high-speed internet by investing in broadband infrastructure deployment and helping to lower service prices. The bill also increased broadband internet speed benchmarks to 100 megabits per second (Mbps) for downloads and 20 Mbps per second for uploads.

29 U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. (May 2021). *Impact of the Coronavirus Pandemic on the Elementary and Secondary Education System*. Retrieved November 19, 2021, from <https://nces.ed.gov/programs/coe/indicator/tcb>.

30 U.S. Department of Education, Institute of Education Sciences. (n.d.). *September 2021 School Pulse Panel: Student Support*. Retrieved December 20, 2021, from <https://ies.ed.gov/schoolsurvey/2021SeptemberSPP/>.

31 Investment and Jobs Act of 2021, 47 U.S.C. § 1751-52 et seq. (2022)

Schools Are Striving to Close Digital Equity Gaps

At the start of the COVID-19 pandemic, many students did not have reliable access to technology for educational purposes.

12%

lacked reliable digital devices access.

9%

lacked reliable internet access.

By the start of the 2021-22 school year, many schools had helped students who needed access.

96%

provided digital devices to students.

70%

provided internet access at students' homes.

49%

provided internet or hotspot access at a location outside of students' homes.



SOURCES: U.S. Department of Commerce, Bureau of the Census, Household Pulse Survey, Week 1. U.S. Department of Education, Institute of Education Sciences, School Pulse Panel, September 2021.

Figure 2. Persistent digital equity gaps during the COVID-19 pandemic made it increasingly important for education agencies to provide devices and internet connectivity to students who needed them.

Chapter Two: Digital Equity Data

Types of Digital Equity Data

Digital equity data have increasingly become key sources of information for educational decision-making to improve access and narrow digital gaps. Potential categories of data that state and local education agencies (SEAs and LEAs) might wish to collect are listed below.

Internet Access

Access at School

- Internet Type—The type of internet service available in the school.
- Internet Coverage—Whether internet access is available in every classroom.
- Access Barriers—What the barriers are to having internet access in every classroom.
- Frequency of Use—How often the Internet is accessed and used in the classroom for student learning.
- Internet Performance—Whether the Internet speed allows users to complete regular activities, including video streaming and uploads, without interruptions caused by poor internet performance.
- Internet Security Measures—What types of protections are enabled on school internet connections (such as a virtual private network or required filtering software).

Access at Home for Students

- Internet Access at Home—Whether internet access is available in the home.
- Internet Type—The type of internet service available in the home.
- Access Barriers—What the barriers are to having internet access in the home.
- Internet Payment—Whether the household, school, or other source pays for home internet service.
- Internet Performance—Whether the Internet speed allows users to complete regular activities, including video streaming and uploads, without interruptions caused by poor internet performance.

Language matters when seeking data about digital equity. The questions asked, and how the data elements of interest are defined, need to be clear and easily understood by all. “Adequate broadband connectivity” or “sufficient internet speed” are too vague to be of any use. After all, an internet connection that is considered adequate for checking email does not mean that the connection can support multiple devices simultaneously streaming high-resolution videos and online games. An easily understood threshold like “Can you stream a movie at home without interruption?” is more specific and will yield better data.

- Internet Security Measures—What types of protections are enabled on school-provided internet connections (such as a virtual private network or required filtering software).
- Upload and download speeds are also helpful to know but could be too burdensome to collect because respondents would need to run an internet speed test. Consider instead asking respondents whether they can stream a movie without interruptions or whether multiple people can use the Internet at the same time without issue. While the information gathered from this type of question might not be as precise as the results of a speed test, the question will be far less burdensome for the average respondent to answer.
- In addition to internet performance data, LEAs and schools may wish to collect provider information if these data will be useful for their needs. Data collectors should note that providers often provide different plans with varying levels of performance, capacity, and quality, and internet connectivity can be disrupted by factors outside of an individual provider’s control, such as severe weather and construction.
- Granular data on the total number of connected people and devices in a household can also be helpful.

Access at Home for Staff

- Internet Access at Home—Whether internet access is available in the home.
- Internet Type—The type of internet service available in the home.
- Access Barriers—What the barriers are to having internet access in the home.
- Internet Payment—Whether the household, agency, or other source pays for home internet service.
- Internet Performance—Whether the Internet speed allows users to complete regular activities, including video streaming and uploads, without interruptions caused by poor internet performance.
- Internet Security Measures—What types of protections are enabled on school-provided internet connections (such as a virtual private network or required filtering software).
- Upload and download speeds are also helpful to know but could be too burdensome to collect because staff would need to run an internet speed test. Consider instead asking staff whether they can stream a movie without interruptions or whether multiple people can use the Internet at the same time without issue. While the information gathered from this type of question might not be as precise as the results of a speed test, the question will be far less burdensome for staff to answer.
- In addition to internet performance data, LEAs and schools may wish to collect provider information if these data will be useful for their needs. Data collectors should note that providers often provide different plans with varying levels of performance, capacity, and quality, and internet connectivity can be disrupted by factors outside of an individual provider’s control, such as severe weather and construction.
- Granular data on the total number of connected people and devices in a household can also be helpful.

Device Access

Access at School

- Device Availability—Number of internet-enabled devices provided by the school for teaching and learning.
- Frequency of Use—How often devices are used for teaching and learning.

- Device Performance–Whether the device allows users to complete regular activities, including video streaming and uploads, without interruptions caused by poor device performance.
- Bring-your-own-device (BYOD) Policy–Whether the school allows students to bring student-owned devices to school for student learning.
- Acceptable/Responsible Use Policy–The rules and guidelines that govern how the network and devices should be used.

Access at Home for Students

- Device Type–The type of device used most often away from school.
- Level of Access–Whether the device is shared or not shared with another person.
- Device Provider–Whether the device is personal, provided by the school, or provided by another entity.
- Take-Home Device Policy–Whether the school allows people to take school-issued devices home for teaching and learning, and if so, what policies are in place for lost, stolen, or broken devices.
- Device Performance–Whether the device allows users to complete regular activities, including video streaming and uploads, without interruptions caused by poor device performance. Data on the age of the device or when it was manufactured can provide insight into the performance and security of the device.

It can be difficult to ensure that students who have multiple home addresses have access at each of their residences. Data from multiple addresses (such as the student’s primary home and their caregiver’s residence) might be useful to collect.

Access at Home for Staff

- Device Type–The type of device used most often away from the worksite.
- Level of Access–Whether the device is shared or not shared with another person.
- Device Provider–Whether the device is personal, provided by the agency, or provided by another entity.
- Take-Home Device Policy–Whether the agency allows staff to take agency-issued devices home for work purposes.
- Peripherals–What types of peripherals staff need to perform their job duties (such as a printer or webcam).
- Device Performance–Whether the device allows users to complete regular activities, including video streaming and uploads, without interruptions caused by poor device performance. Data on the age of the device or when it was manufactured can provide insight into the performance and security of the device.

Staff Resources and Support

- Information Technology (IT) Personnel–Number and type of staff who support the functionality of digital resources and technology infrastructure (these could include IT staff or instructional technology support, for example).
- Technology Instructional Personnel –Number and type of staff who promote the integration of technology into the curriculum (such as technology implementation specialists or technology coaches).

- IT Support Outside of School—Number, type, and availability of staff who support student and staff technology needs outside of school (such as a student who needs help using their school-provided device at home).
- IT Support Requests—Number and type of helpdesk requests received from different user groups (for example, staff, teachers, students, or households).

Digital Literacy

Understanding a person’s level of technology proficiency may also be helpful for digital equity efforts. In the effort to bring digital equity to the home or classroom, the user’s level of digital literacy³² is an important factor in the solution. Digital literacy comprises a broad range of skills, such as proficiency with online learning platforms or the ability to use collaborative tools; a good digital equity solution will complement data literacy strengths and support any weaknesses. Knowing whether a household needs assistance with device and internet setup is also helpful and allows agencies to provide needed support.

The National Assessment of Educational Progress (NAEP) technology and engineering literacy (TEL) assessment at grade 8 measures three interconnected areas of technology and engineering literacy. Results are based on a representative sample of students in both public schools and nonpublic schools and are reported for students overall and for selected demographic groups. More information is available at <https://www.nationsreportcard.gov/tel>.

Knowing whether a household needs assistance with device and internet setup is also helpful and allows agencies to provide needed support.

- Student Technology Knowledge and Skills—Student knowledge of and ability to use technology for learning.
- Student Educational Needs—Student need for instruction on using technology for educational purposes.
- Family Training Resources—The extent to which technology training resources are made available to families.
- Staff Technology Knowledge and Skills—Staff (including teachers and principals) knowledge of and ability to use technology and integrate technology into teaching and learning.
- Staff Professional Development (PD) Needs—Staff (including teachers and principals) need for training and PD on using technology and integrating technology into teaching and learning.

Several digital equity data elements related to device and internet access at school are required for the U.S. Department of Education’s (ED) Civil Rights Data Collection (CRDC). The *Forum Guide to Reporting Civil Rights Data* (https://nces.ed.gov/forum/pub_2017168.asp) presents a variety of effective methods through which local education agencies (LEAs) report civil rights data to ED’s Office for Civil Rights (OCR).

SOURCE: U.S. Department of Education, Office for Civil Rights. (March 2021). *2020-21 Civil Rights Data Collection: List of CRDC Data Elements for School Year 2020-21*. Retrieved December 6, 2021, from <https://www2.ed.gov/about/offices/list/ocr/docs/2020-21-crdc-data-elements.pdf>

Related Data

Other data that may or may not already be routinely collected can be critical for addressing digital equity. Certain data may also be required to receive funding for digital equity programs.

- Household Data—Home language(s), address, economic status, program eligibility, and others.
- Coverage Maps—Types of internet services available in a state or district.

³² The necessary skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information.

- Community Access—Other sources of access to devices, the Internet, and digital literacy training (for example, public libraries, after-school service providers, community partners, and public Wi-Fi coverage in residential areas).

Defining, Collecting, Analyzing, and Reporting Digital Equity Data

In response to the need for all students to be able to access their schoolwork at home, many education agencies implemented and expanded efforts to collect data on digital equity during the coronavirus disease (COVID-19) pandemic. These data have not only shed light on how connectivity and access to devices vary but also have illuminated where inequities have been exacerbated due to pandemic-related disruptions.

It can sometimes be difficult to identify students who do not have adequate access or could benefit from improved access. Families without the needed technology may be reluctant to report that they do not have these resources, while other families who have chosen to live off the grid do not want to be connected to the Internet. Data on highly mobile students can frequently change, requiring new information to be collected whenever a student moves to a new address. Other situations, such as a family suddenly having to cancel their internet plan because of economic hardship, can render recently collected data invalid.

As survey questions are developed, it is important to account for the nuances of digital equity survey questions and whether the questions will collect clear, accurate, and useful data. Consider the internet and device needs for a remote snow day (a few hours for 1 day) versus fully at-home learning (5-6 hours a day, 5 days a week). A student who relies on their parent's cellphone as a Wi-Fi hotspot and borrows their adult siblings' laptop might be able to connect for one remote snow day, but would not be able to partake in fully at-home learning without additional support.

Alleviating Burden While Promoting Comparability

Before the coronavirus disease (COVID-19) pandemic, the West Virginia Department of Education (WVDE) did not collect granular data on student connectivity and devices at home. In 2020, WVDE received approval to collect data on home internet access and devices in its statewide system. The data collection was designed to focus on what resources were available within the home (as opposed to access and devices provided by schools), and the data elements were aligned with best practice recommendations from education organizations. West Virginia districts worked quickly to collect these data and add them to student records in the statewide centralized data system known as the West Virginia Education Information System (WVEIS).

To assist districts with the collection of these data in the 2020-2021 school year, WVDE created a standard data collection template form using an online survey creator that is part of the state's common software as a service (SaaS) suite. The form helps alleviate some of the data collection burden on local education agencies (LEAs) and standardizes the data collected. The form is a freely available option for LEAs to collect the required data for inclusion in WVEIS. If they so choose, LEAs can copy the form template into a local account, adapt it to meet their needs, and customize it with the district's name. They can also use the form throughout the year to capture data more frequently.

Moving forward, WVDE expects to continue collecting data on student home connectivity and devices in some form. These data have proven beneficial for ensuring learning continuity during extended periods of remote instruction and determining potential unmet needs when planning the allocation of program resources and devices like Wi-Fi hotspots. Teachers have also used these data when planning "nontraditional instruction (NTI) days" due to severe weather or illness. Knowing whether students have internet and device access at home helps teachers decide whether to plan for online learning activities during NTI days, or whether take-home paper packets are the more equitable learning option for students without access.

Education agencies can apply strategies and follow established best practices for defining, collecting, analyzing, and reporting digital equity data:

- Data elements such as those provided by the Common Education Data Standards (CEDs) (<https://ceds.ed.gov/>) can promote interoperability, which allows for the quick and easy transfer of data between systems.
- Teachers can sometimes be the first to notice which students are experiencing access issues. Outreach by parent liaisons, school social workers, and counselors can also help identify students in need of improved access.
- Data collection need not be limited to data staff. Teachers and student support staff can also assist with collecting digital equity data from hard-to-reach respondents.
- Surveys that follow best practices for design and dissemination have the potential to yield reliable responses and actionable insight:
 - The purpose and intended use of the data should guide the development of data collection instruments. Surveys with confusing directions or unclear questions can depress response rates; surveys with precise language and questions that are easily understood by the intended audience are more effective and will yield more accurate data.
 - Providing surveys in multiple languages can help meet the needs of the local population.
 - Shorter surveys can be more effective than longer surveys that ask for lots of detailed information. This is a particularly useful approach for families that have minimal technical experience and could find detailed surveys to be confusing and stressful. Shorter surveys also benefit people that access the survey on their smartphones.
 - Ensuring equity in online survey responses can be challenging because some respondents might not have internet access. Agencies may need to use alternative methods to collect data such as paper surveys, call out telephone system surveys, or a public kiosk for those without access.
- Consider focusing on collecting key data items that can provide insights that will lead to the most impactful action. While more information might be desired, data that are not necessary for identifying digital equity gaps do not necessarily need to be collected.
- In addition to surveys, digital equity data can also be collected during the student enrollment and registration process.
- Data that are automatically generated, such as student log-ins to online learning resources after hours, can also be used to identify students who may be experiencing access issues.

Jonesboro Public Schools (AR) collected digital equity data via an online survey, then paper forms sent home with students and distributed at parent-teacher conferences. Collecting responses via paper forms was challenging, as was the necessary manual data entry.

Saint Louis Public Schools (MO) has created kiosk systems in two areas of its Central Office. One is housed in the Human Resources Department and may be used by applicants to apply for jobs in the district. Additionally, during the onboarding timeline, people also apply for their district network sign-on and password to applications. The other kiosk system is in the transcript office where graduates can visit to obtain their records for college and work entities. Students who were enrolled in the district, but not graduates, can also obtain their records from the schools where they were enrolled.

Digital Equity Surveys

The following is a sample list of digital equity survey instruments developed by state and local education agencies (SEAs and LEAs); it is not intended to be comprehensive.

- 2019-2020 Future Ready Nebraska District Technology Profile: https://nde.co1.qualtrics.com/results/public/bmRILVVSXzRUUTh3bXBnSutwYnVMMY01ZDZmZmQxNjI4NjcyMjAwMTAxNWQ4YzM=#/pages/Page_09a7b6f5-733c-4ab7-b859-138f2532e639
- Anchorage School District (AK) Digital Equity Survey: <https://www.asdk12.org/cms/lib/AK02207157/Centricity/Domain/1180/ENGLISH-ASD%20Digital%20Equity%20Survey.pdf>
- Hamilton County - Broadband Survey: https://www.surveymonkey.com/r/Preview/?sm=vpu8_2BpkmRHJ2RDlm_2B_2FCaoQ4KsNmMboImUnH2ZHAEMdJzWeOPRRxlXgWuSmZCrSuG
- Nashville Digital Inclusion Needs Assessment Results Questionnaire: <https://data.nashville.gov/api/views/a5y8-6i89/files/97748194-73c6-489a-bb89-8606d16744e8?download=true&filename=Nashville-Digital-Inclusion-Needs-Assessment-Results-Questionnaire.pdf>
- New York State Education Department (NYSED) Digital Equity Survey: <http://www.nysed.gov/memo/information-reporting-services/digital-equity-survey-data-collection-and-reporting-sirs>

The Importance of Quality Data

High-quality and accurate data serve as the foundation for understanding the condition of education. The quality of data, including digital equity data, is contingent on the effectiveness of the practices and processes used to produce data. The *Forum Guide to Building a Culture of Quality Data: A School & District Resource* (https://nces.ed.gov/forum/pub_2005801.asp) identifies four major attributes of high-quality data:

- Accuracy—The information must be correct and complete. Data entry procedures must be reliable to ensure that a report will have the same information regardless of who fills it out.
- Security—The confidentiality of student and staff records must be ensured, and data must be safe.
- Utility—The data must provide the right information to answer the question that is asked.
- Timeliness—Deadlines are discussed and data are entered in a timely manner.

The *Forum Curriculum for Improving Education Data: A Resource for Local Education Agencies* (https://nces.ed.gov/forum/pub_2007808.asp) provides lesson plans, instructional handouts, and related resources, and presents concepts necessary to help schools develop a culture for improving data quality.

Data definitions are a common struggle for agencies. A data standard such as CEDS (<https://ceds.ed.gov/>) with a commonly agreed-upon set of definitions and options for a given selection of data elements, data entities, and relationships can help agencies collect common, comparable, high-quality data. CEDS includes all of the data elements needed for federal reporting.

Chapter Three: Closing Digital Equity Gaps

Using Digital Equity Data

The ultimate purpose of education data use is to take action to improve the education system and student learning. Digital equity data have provided agencies with new information on equity, opportunities to learn, and how connectivity varies. Data provide the information needed for agencies to develop policies, programs, and practices to close digital equity gaps. Furthermore, the data can be used to identify access issues, develop coverage maps, and prioritize resource allocation. The need to close digital equity gaps is clear, and taking action to address digital equity is necessary to prepare students to engage in the full range of social, educational, economic, and civic opportunities available in modern society.

The Cycle of Data Use

The *Forum Guide to Taking Action with Education Data* (https://nces.ed.gov/forum/pub_2013801.asp) discusses the cycle of data use, which consists of five primary phases or activities:

1. Seek information—Find the right data to address the specific information need at hand.
2. Access/gather data—Gather data that are most relevant to information need. This might require a new data collection or, in many cases, involve accessing data that have already been collected.
3. Analyze/interpret data—Derive logically (or statistically) sound evidence to inform decision-making and action.
4. Act—Take action to answer a question, address a problem, or change a situation.
5. Evaluate—Evaluate whether changes from acting on data have improved the situation.

Data from one source alone is rarely sufficient to understand the extent of digital inequity and take action to address inequity. For example, coverage maps may have certain limitations; maps that identify census blocks where at least one person has internet access can overcount true availability. Multiple data sources (such as the results of a digital equity survey, coverage maps from all available internet service providers [ISPs], and socioeconomic data) often need to be combined and interpreted to fully illustrate the current state of digital equity. Different strategies will work better based on the needs of the population and local context. Factors such as urbanicity, cultural viewpoints, and languages, among others, will influence how agencies approach digital equity.

Digital resources, devices, and skills have the potential to improve educational outcomes, but all students must be able to fully benefit if digital equity is to be achieved. Free or discounted internet plans and device programs may prove to be helpful but are not stand-alone solutions to digital inequity. Digital equity encompasses consistent access to secure high-speed internet

and technology devices, information technology (IT) support, and digital literacy learning opportunities in and out of school for all students, including those with special needs, teachers, staff, and school leaders.

Providing Internet Access

Access at School

Internet availability in schools rapidly expanded in the late 1990s and 2000s³³ and is now an essential feature of education facilities, including classrooms, central offices, and school administrative offices. In addition to availability, the quality and capacity of the internet network must also be sufficient. A robust network within education facilities is needed for teaching, learning, and working. Adequate bandwidth and infrastructure ensure that online resources and systems are readily available for students, staff, and teachers. An assessment of network capabilities can determine whether the network can support current bandwidth needs and meet future needs, or whether the network may need to be upgraded to support the full range of connectivity needs. Mapping network coverage and density and bandwidth utilization will also help agencies ensure that internet coverage within facilities is adequate to meet user needs. Following industry-accepted standards for network quality and monitoring network performance can minimize potential bottlenecks and bandwidth issues. Older school facilities that have not been modernized might not be ready for Wi-Fi and often require more resources to be connected to the network.

During the coronavirus disease (COVID-19) pandemic, some school districts upgraded their networks to provide more bandwidth for streaming virtual and hybrid instructional and learning activities.

Access Outside of School

Ensuring internet access outside of school is a more intractable problem than providing internet access in school, but that should not deter education agencies. Internet access at home is a critical part of digital equity and worthy of concentrated effort on the part of state and local education agencies (SEAs and LEAs). Some low- and no-cost internet plans require applicants to provide a monetary deposit or have a minimum credit score, which can pose a barrier to applicants with limited financial resources or credit.

During the coronavirus disease (COVID-19) pandemic, agencies have been creative in expanding internet access to those who need it. Some local education agencies (LEAs) dispatched buses with Wi-Fi to neighborhoods where students and teachers lacked access.

In addition to surveying households to identify which need dedicated internet for their students, geographic information systems (GIS) and student address data can identify neighborhoods where internet access is poor. Reviewing broadband access maps can also identify gaps.

Possible connectivity solutions, ranging from immediate deployment to longer-term implementation timelines, include the following:³⁴

- **Mobile Hotspot**—A small, portable device that connects to the Internet via cellular service and emits a Wi-Fi signal.

33 U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. (August 2010). *Number and Internet Access of Instructional Computers and Rooms in Public Schools, by Selected School Characteristics: Selected Years, 1995 through 2008*. Retrieved December 29, 2021, from https://nces.ed.gov/programs/digest/d12/tables/dt12_120.asp.

34 U.S. Department of Education, Office for Education Technology. (July 2021). *Home Access Playbook: Strategies for State Leaders Working to Bridge the Digital Divide for Students*. Retrieved November 23, 2021, from <https://tech.ed.gov/home-access-playbook/>.

- School or Community Wi-Fi Hotspots (for example, drive-up parking lot hotspots)– Wireless access points set up at schools or other community locations that provide free service.
- School or Community Bus Wi-Fi–A Wi-Fi-equipped school or community bus that is parked in a public location (such as an under-connected neighborhood) and provides free internet access to students within a certain radius of the bus.
- Off-campus Wireless Network–A school-owned Wi-Fi network that provides free, basic wireless internet access to the homes of students or other community sites (often neighborhoods with the greatest need).
- Sponsored Internet Service–States, districts, or schools temporarily cover the monthly cost of a low-price internet service plan for students who lack internet service.
- Broadband Infrastructure Deployment–Federal, state, and local funds are used to develop broadband networks or infrastructure through which broadband services can be delivered.

Satellite internet is also expanding access, particularly for rural and underpopulated areas that have no other way to connect. Many public spaces and community institutions, such as libraries, community centers, and public parks, provide free public access to the Internet.

Providing Devices

Access at School

From school computer labs and lab carts to tablets and smartboards, digital learning devices have been widely adopted in schools and classrooms. However, the infusion of technology in education settings has not been equally distributed, nor are opportunities for students to use digital devices in school equally available. Bring-your-own-device (BYOD) policies permit students to use their own mobile devices (laptops, tablets, and cellphones) at school, but have left behind students without a personal device. Supplementing a BYOD program with a program that supplies any student lacking a personal device with a district-owned one grants all students equal access to digital devices during the school day. BYOD programs might also result in students bringing a wide range of devices to school. This could unintentionally exacerbate digital inequity, and staff might not be able to support BYOD devices as effectively as devices that are provided by the school. 1:1 programs that provide all students with the same devices do not run the risk of exacerbating digital inequity.

Another important consideration is the extent to which students can use the digital devices that are available in school. A technology implementation plan can help agencies ensure that learning opportunities with technology are integrated throughout the curriculum and that technology use aligns with student learning goals and supports student achievement. The *Forum Guide to Technology Management in Education* (https://nces.ed.gov/forum/tech_management.asp) contains best practice information for selecting and implementing technology to support teaching and learning.

Technology Accessibility

Accessibility and assistive technologies for populations with special needs must also be considered. Accessibility ensures that students with disabilities have an equal opportunity to receive the educational benefits and possibilities afforded by education technology, as well as equal treatment in the use of such technology. Many modern school buildings include accessibility features such as ramps, automatic doors, signs with braille, and bathrooms with grab bars and large handle faucets. Similarly, accessibility features and technologies such as text-to-speech, speech-to-text, enlarged font sizes, color contrast, audio description, closed captioning, and special keyboards help make education technology accessible to everyone. These adaptive technologies can be particularly effective for meeting the needs of students with special needs.

The *Forum Guide to Ensuring Equal Access to Education Websites: Introduction to Electronic Information Accessibility Standards* (https://nces.ed.gov/forum/pub_2011807.asp) provides best practices for complying with Section 508 goals at an operational level in state education agencies, districts, and schools.

Access Outside of School

While it is easier for school officials to manage digital equity in school buildings, inequity outside of school also needs to be resolved. District-provided device programs, such as 1:1 programs that provide every student with a standard device (such as a laptop or tablet), ensure that each student has a device available for use at school and home. Some LEAs expect students and teachers to take their school-provided devices home every day. This way, learning can continue if the student cannot attend school in person, whether due to inclement weather, illness, or another barrier.

During the coronavirus disease (COVID-19) pandemic, many local education agencies (LEAs) that did not previously have a 1:1 program had to quickly implement device programs to ensure students could participate in remote education.

Device programs can be a large undertaking. Agencies can benefit from a detailed implementation plan that addresses different aspects of the program. Potential considerations include the following:

- goals for the program;
- implementation timelines with milestones;
- benchmarks for measuring progress towards goals;
- policies and procedures for device selection, procurement, distribution, repair, and replacement;
- plans to refresh devices periodically (for example, issuing new devices to students in 1st, 5th, and 9th grade);
- assignment of responsibility for program implementation;
- identification of needed training and IT resources for users;
- tools and software needed to track and manage device inventory;
- determination of whether IT support will be provided by staff or outsourced to a vendor;
- allocation of human resources, including staff time;
- allocation of financial resources for devices, the staff that will support the program, training, and the sustainability costs of device insurance and replacement; and
- whether the funding source limits who may use the device and for what purposes.

Equitable Device Distribution and Support

During the coronavirus disease (COVID-19) pandemic, South Portland School Department (ME) (SPSD) implemented equitable strategies for providing and distributing digital devices within the 14-square mile district.

The district expanded its 1:1 program during the COVID-19 pandemic and standardized the devices provided to students. Hotspots were also provided to the 8-10 percent of families that did not have internet access and needed to be connected for remote learning. If a device needed repair, it could be swapped out for a different working device. This ensured that any interruptions to student learning would be brief and minimized the need for families to make a second trip to pick up the repaired device. Beyond making it easier for district staff to make repairs and provide information technology (IT) support, the adoption of standardized equipment ensured that all students had equal access to digital devices.

To minimize in-person interaction during the pandemic, SPSD implemented a contact-free option for distributing devices. Small lockers were removed from the district's shop class and installed outside of school in a centralized location along the City of South Portland's bus routes. The lockers were available 24/7 for families to pick up a new district-provided device or swap a device that needed repair. Combination locks were used to secure each locker. Families could request the contact-free option for pickup/swap; once a locker was ready for use, the district would share the lock code via email or text.

SPSD also used school buses to deliver devices to families unable to leave their homes due to lack of transportation, health and safety (such as COVID-19 quarantine or isolation), or another barrier. The transportation department was already delivering meals to homes and added device delivery to its schedule. Having the transportation department deliver devices was more efficient due to their extensive dispatch experience. Families trusted the transportation department's delivery of devices because school buses are easily identifiable and more familiar compared to the unmarked personal vehicles of staff.

These distribution methods were originally adopted out of necessity to provide contact-free options that minimized the risk of COVID-19 transmission. However, SPSD quickly realized that the lockers and buses provided equitable access for families. Not all families have the time and means to travel during school hours, and having to take time from work to pick up a device at school can be a hardship for some parents and guardians. By removing time and transportation restrictions from families, SPSD ensured that all students had access to the devices they needed for their learning.

In some ways, the small footprint and high population density of the district proved advantageous. The district did not have to deal with compromised hotspot functionality, which very rural or mountainous areas often face. Implementing contact-free distribution methods was also easier than it would have been if SPSD were a rural, geographically large district with a smaller enrollment. While digital equity in rural areas is sometimes prioritized, SPSD has shown that digital equity in cities is also worthy of attention.

Ensuring Privacy and Security

Privacy and security are of critical importance in education agency operations, including the collection, management, and use of education data. Education agencies have a responsibility to protect their systems and data from potential threats.

Education agencies can implement policies and processes to protect their systems and data:

- Train all users on how to ensure cybersecurity and data privacy. Tailoring training to specific user groups is integral to meeting their individual needs and obligations. Students would benefit from training on how to responsibly use school-provided devices and protect their information online, whereas staff who routinely work with student data will need to keep current on federal, state, and local data privacy requirements.
- When crafting data privacy and cybersecurity policies and procedures, ensure full compliance with federal, state, and local laws and standards.
- A comprehensive inventory of all network-connected agency assets can not only help agencies understand their cybersecurity risk, but can also inform device program management decisions.
- Require secure log-ins to access all agency systems and devices, including remote access, and grant access only to authorized individuals.
- All agency-provided devices and internet connections should align with federal, state, and local privacy and security requirements and guidelines. Agencies may have different levels of protection for student data, and there may be data privacy issues with providing temporary or contract staff with access to devices or the Internet.
- Install automated cybersecurity and privacy tools and software on agency devices, including those that are deployed to students, teachers, and staff for off-campus use.
- Consider installing internet safety filters on all agency-issued hotspots and devices that are used on- and off-campus.³⁵

Meeting Federal Requirements

The Children's Internet Protection Act (CIPA) requires schools that receive Universal Service Program for Schools and Libraries (E-Rate) program discounts for internet access or internal connections to certify that they have an internet safety policy that includes technology protection measures that block or filter internet access to certain content.

Schools subject to CIPA are also required to:

- certify that their internet safety policies include monitoring the online activities of minors; and
- educate minors about appropriate online behavior.

More information is available on the Federal Communications Commission's website: <https://www.fcc.gov/consumers/guides/childrens-internet-protection-act>.

Tabletop exercises can assist agencies in determining how to approach potential security issues for devices that are used off-campus. These exercises consist of small-group discussions that walk through a scenario and the courses of action an agency or organization will need to take before, during, and after an emergency or incident to lessen the impact. These exercises help assess plans and resources, and facilitate understanding among key decision-makers and stakeholders. The *Forum Guide to Cybersecurity: Safeguarding Your Data* (https://nces.ed.gov/forum/pub_2020137.asp) contains a case study on Bozeman School District #7's (MT) experience using tabletop exercises to develop a data breach response protocol.

³⁵ Students that use school-provided devices may not have the same access to online content because required internet safety filtering technology typically restricts or completely blocks noneducational content. Instructional staff should ensure that online learning activities can be accessed by all students and are not blocked by filtering software.

- Use a virtual private network (VPN) when staff work remotely.
- Consider limiting hotspot connections to school-provided devices.
- Exercise prudence, respect student privacy, and follow data minimization best practices by limiting the collection of student data and avoiding the monitoring of students in the home and after school hours.
- Push out software updates to all agency-issued devices. A policy that staff must shut down their work-provided devices at the end of the day can also help ensure software updates are made.
- Ensure that agencies and vendors establish written data-sharing agreements for all digital tools and devices.

Privacy and Cybersecurity Resources

Guidance and legally authoritative resources on protecting student privacy are available through the U.S. Department of Education Student Privacy Policy Office (SPPO) website: <https://studentprivacy.ed.gov>. The SPPO has developed numerous resources, including online training modules, videos, webinars, and frequently asked questions to help states, districts, and schools protect the privacy of student data. The Forum has also developed several resources that contain best-practice information on privacy and security:

- ***Forum Guide to Cybersecurity: Safeguarding Your Data***
https://nces.ed.gov/forum/pub_2020137.asp
This resource provides timely and useful best practice information to help education agencies proactively prepare for, appropriately mitigate, and responsibly recover from a cybersecurity incident. It provides recommendations to help protect agency systems and data before, during, and after a cybersecurity incident and features case studies from state and local education agencies (SEAs and LEAs).
- ***Forum Guide to Education Data Privacy***
https://nces.ed.gov/forum/pub_2016096.asp
This resource provides SEAs and LEAs with best practice information to use in assisting school staff in protecting the confidentiality of student data in instructional and administrative practices. SEAs and LEAs may also find the guide useful in developing privacy programs and related professional development programs.
- ***Forum Guide to Data Governance***
https://nces.ed.gov/forum/pub_2020083.asp
This resource provides timely and useful best practices, examples, and resources for agencies implementing or updating their data governance programs. It provides an overview of data governance; discusses effective data governance practices, structures, and essential elements; describes how to meet privacy and security requirements while also meeting data accessibility and sharing needs; and includes detailed case studies from education agencies in their data governance efforts.

Supporting IT Needs

IT staff can break down some of the barriers to achieving digital equity. Support can range from helping a student who needs to set up their school-provided mobile hotspot, to assisting a teacher who needs to connect a school-provided device to their district's VPN, to working with a staff member who needs to download address data from a broadband deployment map.

Inoperable or unusable technology does not support student learning and agency operations. Just-in-time technical support minimizes the time and energy users spend on troubleshooting and problem solving, allowing that effort to be redirected towards using the technology. Whether in-person or remote, IT assistance ensures that the technology provided is operational and usable by teachers, staff, and students.

IT support can take many forms, and has expanded to accommodate user needs within and beyond the classroom and workplace:

- IT support after school and in the evenings can be very helpful for students who need assistance when completing homework assignments.
- Being mindful of student data privacy, secondary students with technical skills could assist with device initiatives and helpdesk support by cleaning devices, performing minor device repairs, and completing other tasks that do not risk data security and privacy.
- Some LEAs have IT support hotlines and resources for parents who need support when helping their children with homework or remote learning.

Student-run tech support can alleviate some of the demands placed on information technology (IT) staff, while also equipping students with technical skills. This type of support can range from informal requests for students to help their peers use a new district-approved software to full-service student-run IT support programs where students receive course credit for taking tech support training classes and working the helpdesk. These programs equip students with the technical knowledge and practical skills needed for future college and career success.

Helping Parents' and Students' Information Technology (IT) Needs

During the coronavirus disease (COVID-19) pandemic, families increasingly needed technical support to help their children with remote learning; working adults often had to help their children very early before the start of the workday, or later at night after their workday was over. South Portland School Department (ME) (SPSD) decided to help these parents, while at the same time adapting staff assignments from an in-person environment to a remote setting. The district's IT technicians whose work could only be performed in person were given the opportunity to support SPSD's new phone-based parent helpdesk. SPSD increased its hours and expanded its helpdesk services to support families. The district chose to provide phone-based support (rather than web-based support) to ensure that technology would not hinder families from accessing the support they needed. This also allowed SPSD to use translation services more easily, allowing the district to support families regardless of language barriers.

IT support decisions may be affected by several factors, including the following:

- Proactive IT assistance, such as help guides and technology training, can reduce the need for just-in-time support that is used once a problem has occurred.
- Teachers are often the first line of technical support for students. Instructional staff need professional development (PD) on IT support to help meet student needs.
- IT staffing models must be appropriate for the level of support provided. A 24/7 helpdesk will require different support than a traditional helpdesk that is only open during normal school hours. IT staff members' workdays or schedules may need to be adjusted; for instance, staff who provide IT support to parents and students after school hours might be permitted to start their workday later to account for evening work.
- Establishing clear expectations can help focus IT support on meeting needs that are within the agency's purview. For example, school IT staff would be responsible for any IT needs related to a school-provided device, but any needs related to a user's home Wi-Fi router or internet speed would be directed to the user's ISP. LEAs can work with local providers to help with support issues; this way, when families contact the district for assistance with connectivity issues at their home, the district can connect the families to their ISP for assistance.
- An agency with a large userbase might find it necessary to have multiple helpdesks to address different needs, such as

- a helpdesk located off-campus in a community hub;
- a helpdesk for students and parents;
- a helpdesk for teachers and instructional staff; and
- a 24/7 helpdesk to provide round-the-clock support and manage overflow during high-volume times. Providing off-hours IT support may necessitate creative scheduling or shift work not previously considered for staff.

Promoting Digital Literacy

Providing devices, internet access, and IT support alone does not solve digital inequity. Students, their parents and caregivers, and staff also need to be digitally literate. A lack of digital literacy can be a major barrier to digital equity. Digital literacy refers to the necessary skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information.

During the coronavirus disease (COVID-19) pandemic, educators adopted creative methods to help students develop digital skills in a structured environment where they can get the support they need to be successful. For example, a teacher leading weekly virtual meeting simulations when students were in the classroom not only taught students how to use their school-provided device to log into an approved virtual meeting platform, they also helped ensure students were prepared for school on remote learning days.

Technology that is simply used as an add-on to the existing curriculum is not an effective approach to teaching digital literacy. Digital literacy instruction can be embedded across the curriculum to equip students with the skills to find, evaluate, organize, create, and communicate information. Education agencies and national organizations have developed digital literacy standards that define what students should know and be able to do at each grade level. For example:

- The Virginia Standards of Learning for Digital Learning Integration describe a progressive development of knowledge and skills necessary to access, evaluate, use and create information using technology. The focus is on learning to use technology effectively and wisely rather than learning about technology: <https://www.doe.virginia.gov/support/technology/standards/index.shtml>.
- The West Virginia College- and Career-Readiness Standards for Technology and Computer Science include content standards for technology and computer science that are both rigorous and challenging. The standards provide a focus for teachers to teach and students to learn those skills and competencies essential for future success in the workplace and to further education: <https://apps.sos.wv.gov/adlaw/csr/readfile.aspx?DocId=50990&Format=PDF>.
- The Wisconsin Standards for Information and Technology Literacy are an important foundation to prepare students to be college- and career-ready: <https://dpi.wi.gov/imt/it-literacy-standards>.

A common set of software and tools for all students to use can increase digital equity and literacy. Additionally, software and online tools that can be accessed and used from any device (school-provided, personal, or public) can be helpful, as they remove device-related barriers that sometimes hinder access.

Providing students with digital literacy training is not sufficient if educators do not know how to use technology effectively in the classroom. Students also need access to educators who know how to use digital tools and create online instructional content. Caregivers also need digital literacy resources to support student learning and ensure families can access student services.

A Condensed Selection of Strong Software Solutions

During the coronavirus disease (COVID-19) pandemic, the number of software options available to local education agencies (LEAs) grew exponentially. Rather than expand its suite of software solutions, South Portland School Department (ME) (SPSD) chose to contract with fewer vendors and standardize the software used during remote learning. This decision yielded positive results operationally and proved to be equitable. Using a few, common software solutions meant that the SPSD could develop more robust training in multiple languages to meet the needs of their community. Standardization also made it easier for students to learn how to use the software, which then allowed them to focus on learning their school materials. This was particularly helpful for highly mobile students. Students who move within the district do not have to worry about falling behind because of unfamiliar software. Instead, these students can quickly begin learning in their new classes using the same software that they were already familiar with.

As educational technology rapidly changes and advances, educational staff need ongoing training to keep up to date. Districts can provide teachers and instructional staff with PD training around the use of technology for learning. Training should be

- implemented regularly;
- provided during educator work hours;
- incentivized to encourage participation;
- tailored to meet each individual's needs;
- continually updated to reflect current trends and technologies; and
- include time for applied learning.

Software and platforms that support training and PD are available for use by SEAs and LEAs. In addition to ensuring staff have time in their schedules to participate in PD, staff need time to practice their new skills and integrate what they learned into their day-to-day work. Ongoing PD equips staff with the skills and knowledge they need to use technology successfully, and thus serve as models of responsible and effective technology use for their students.

Funding Digital Equity Programs

Digital equity funding is not limited to purchasing devices and internet service. Budgets for digital equity might also include ongoing maintenance, updates, IT support, and digital literacy education and PD to support the implementation and use of the technology. During the initial months of the coronavirus disease (COVID-19) pandemic, collecting digital equity data was often a large undertaking for agencies that called for additional staff and finances. As the collection and use of digital equity data have become a routine part of many agencies' normal data procedures, the financial burden of these collections has been minimized.

Cost-saving strategies:

- Bond initiatives
- Bulk device purchases
- Private donations from organizations or individuals
- Utilization of federal funding, such as the Universal Service Program for Schools and Libraries (E-Rate) program
- Recycling, repurposing, or sale of older devices
- Gradual phase-out of school computer labs and classroom lab carts that are no longer needed due to 1:1 programs
- Collaborative development of curricula, open education resources (OER), or online textbooks, which may sometimes be cost-effective compared to purchasing licensed or hardcopy instructional materials

Sustainability planning is essential for the long-term success of digital equity efforts. Ongoing funding is needed to support internet access, network maintenance, digital devices, and technology support and training. 1:1 programs, for example, are high-cost and need dedicated

funding to be sustainable. Insufficiently funded digital equity efforts are more likely to fail. Budgetary decision-making processes that carefully weigh available options and select cost-effective approaches result in more sustainable and effective outcomes.

During the coronavirus disease (COVID-19) pandemic, governments, local organizations, internet service providers (ISPs), and private donors provided the funds needed to acquire devices and pay for internet services.

Emergency funding greatly helped in closing digital equity gaps during the COVID-19 pandemic. As these temporary funding streams close, agencies must determine how to maintain the new digital equity programs that were started with pandemic-related funds and how to measure outcomes from the funding. For example, agencies that used one-time pandemic-related funding to purchase devices must now budget for inventory, IT support, and internet safety filters. Device replacement and growth in network demand based on user needs are also expected. Staff, PD, device refresh cycles, curricular materials, and teaching around digital literacy are other considerations for funding decisions that budgeters can expect to plan for.

Federal Funding Sources


The federal government has many funding opportunities that support digital equity, broadband planning and deployment, devices, equipment, and more. The National Telecommunications and Information Administration's BroadbandUSA program (<https://broadbandusa.ntia.doc.gov/>) serves state, local, and tribal governments, industry, and nonprofits that seek to expand broadband connectivity and promote digital inclusion. The BroadbandUSA website contains a searchable database of various funding opportunities that support broadband planning, digital inclusion, and deployment projects: <https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding>.

The following is a sample list of federal funding opportunities; it is not intended to be comprehensive.

- **Affordable Connectivity Program (ACP)**
<https://www.fcc.gov/affordable-connectivity-program>
In November 2021, Congress created this new long-term \$14 billion Federal Communications Commission (FCC) program to help ensure people can afford the connections they need for work, school, health care, and more for a long time.
- **ConnectHome**
<https://www.hud.gov/connecthomeusa>
The U.S. Department of Housing and Urban Development launched this program to address the “homework gap” for students in grades K-12 living in public and Indian housing by offering broadband access, technical training, digital literacy programs, and devices for residents in assisted housing units.
- **Coronavirus Aid, Relief, and Economic Security Act (CARES Act)**
<https://oese.ed.gov/offices/education-stabilization-fund/>
The U.S. Department of Education (ED) created four grant programs that can be spent on hardware and software, connectivity, and instructional expertise to support remote learning, among other activities.
- **The Elementary and Secondary Education Act (ESEA), as amended by the Every Student Succeeds Act (ESSA), and the Individuals with Disabilities Education Act (IDEA)**
<https://tech.ed.gov/files/2017/01/2017.1.18-Tech-Federal-Funds-Final-V4.pdf>
This letter provides examples of how funds may support the use of technology to improve instruction and student outcomes.
- **Emergency Connectivity Fund (ECF)**
<https://www.fcc.gov/emergency-connectivity-fund>
The FCC's ECF is a \$7.17 billion program that aims to help schools and libraries provide the tools and services their communities need for remote learning during the COVID-19 pandemic.
- **Lifeline**
<https://www.fcc.gov/general/lifeline-program-low-income-consumers>
The FCC Lifeline program provides subscribers a discount on qualifying monthly telephone, broadband, or bundled voice-broadband packages to help ensure that low-income consumers can afford 21st-century broadband and the access it provides to jobs, healthcare, and educational resources.
- **Universal Service Program for Schools and Libraries (E-Rate)**
<https://www.usac.org/e-rate/>
The FCC E-Rate program provides discounts for telecommunications, internet access, and internal connections to eligible schools and libraries.

Collaboration and Partnerships

SEAs, LEAs, and schools are not alone in working to achieve digital equity. Agencies need support from families and the community at large to help bridge the gaps, making community outreach key to improving digital equity. Community buy-in, and the partnerships that arise from it, are crucial to the sustainability of digital equity efforts. Community engagement can help foster an understanding of the importance of digital equity and encourage community members to support digital equity efforts.



Existing community resources, such as a local library system, can serve the immediate needs of the community by helping students gain access to high-quality digital content, internet resources, and reliable devices. Organizations and education agencies can also work together to identify the specific digital equity needs of individual communities. Government agencies, consortia, and cooperatives could collaborate with local telecommunications services to push connections forward and expand coverage maps.


Education agencies can partner with other regional, state, and local agencies on digital equity efforts. Coordinated action at the state or county level that involves multiple stakeholder groups may be more impactful than what might be possible for any single agency. These types of coalitions have the potential to help leverage resources, build capacity, and capitalize on expertise. Potential sectors that could be involved in this work include infrastructure, technology, education, economic development, workforce development, and healthcare.

While serving the needs of students and their families is one of an education agency's many responsibilities, IT support and digital literacy training for the broader community and households without students is beyond the purview of SEAs, districts, and schools. This type of need is best met by other agencies and organizations, such as public libraries, social service agencies, boards of trustees, workforce development agencies, and local technology non-profits. Although an education agency's responsibilities to provide these services do not extend to the broader public, SEAs and LEAs can collaborate with appropriate agencies and organizations whose role is to meet the IT and digital literacy needs of the broader public. For example, in the City of Cambridge, MA, the city government takes the lead in meeting residents' digital equity needs, while the district's primary focus is homes with school-aged children. In Bozeman School District #7 (MT), a memorandum of understanding with a local non-profit allows schools to work with the non-profit's family liaisons and problem-solve for individual families.

Persistent Challenges

Measuring digital access, providing discounted or free high-speed internet, and deploying laptops, hotspots, and Wi-Fi hubs have all helped to close the digital divide, but challenges persist:

- Funding to sustain digital equity efforts is a perpetual challenge. While available funding increased during the pandemic, some funding sources were intended to be temporary and need to be replaced with permanent funding streams to sustain digital equity efforts.
- The degree of cooperation and collaboration may decrease after COVID-19-related funding for digital equity is exhausted.
- Expanding broadband access to rural areas is a costly and time-consuming endeavor.
- Cell towers and hotspots sometimes do not work in rural or mountainous areas.
- Issues such as Wi-Fi router location, building construction, signal interference from other devices, high usage or demand, and unsecure connections can all inhibit at-home internet access.
- Emerging technologies could impact connectivity and have implications for providing support to students and families.
- Supply chain disruptions can occasionally limit the availability of needed devices.
- Devices are subject to damage, loss, and theft, and ultimately need to be replaced once they reach the end of their lifecycle.
- Sometimes, more devices than anticipated are needed. During the pandemic, agencies that did not have devices on hand had to wait months for orders to be fulfilled.
- Device inventories need to be maintained and periodically refreshed.

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- Compiling and managing an inventory of software and tools being used in schools and classrooms can be time-consuming, especially when teachers can select their own software tools.
 - Cybersecurity and privacy threats continue to emerge and can threaten people who use digital technologies.
 - Allocating time and funding for digital literacy training and PD for current and incoming teachers can sometimes be difficult.

Conclusion

SEAs, LEAs, and schools need to be nimble in responding to digital inequities, be it during a crisis or routine changes in educational practices and opportunities for students, education technology, and infrastructure. Digital equity is multifaceted and encompasses consistent access to secure high-speed internet and technology devices, IT support, and digital literacy learning opportunities, all of which need to be addressed. Digital equity data can identify digital equity gaps and drive targeted action to close them. Digital equity work is difficult; while some complications may never be solved, agencies do not stand alone in addressing the immense challenges to achieving digital equity. Stakeholder engagement and collaboration are critical keys to achieving digital equity. Education agencies can utilize available funding, draw strength from resources and support from other agencies and organizations, apply lessons learned, and work collaboratively and creatively to tackle obstacles, all in pursuit of digital equity.

Chapter Four:

Case Studies from State and Local Education Agencies (SEAs and LEAs)

This chapter presents case studies that detail the actual experiences of state and local education agencies (SEAs and LEAs) concerning digital equity. They emphasize best practices and lessons that states, districts, and schools can learn from when addressing digital inequities.

Just as digital equity needs vary based on local factors, the methods and strategies featured in this chapter differ in multiple ways and are based on each agency's experience. Given that technology is ever-evolving, no single case study or group of related case studies will necessarily present a comprehensive solution to addressing digital inequity in education agencies.

Cambridge Public Schools (MA): A Nuanced Approach to Digital Equity

Cambridge Public Schools (MA) (CPS) has found that there is no one solution to digital equity that will apply to all families. Instead, CPS aims to meet families where they are, understand their unique needs, and provide them with the individualized support they need to be connected in a meaningful way.

Data Collection and Use

The district has collected digital equity data for more than 10 years using a variety of methods to reach all households with CPS students, regardless of access, including surveys (online and paper-based), home visits, family community fairs, and teacher observations. CPS has also worked with partner organizations that focus on connecting families to high-speed broadband and citizen grassroots organizations to collect digital equity data. The data collected provide information on internet access (and bandwidth, where available), whether other family members access and use the same connection, and devices used at home. CPS uses these data to identify gaps and work to address them through solutions that will best address individual needs, whether that be providing an internet hotspot, digital device, broadband access, or education. This information became particularly important as the coronavirus disease (COVID-19) pandemic disrupted continuity of learning for students who did not have access.

Addressing the Challenge

In school year (SY) 2018-19, CPS created a 1:1 program that provided all grade 9-12 students with a device that could be taken home. Students were not allowed to use personal devices in school, although this did not account for disparities outside of school; the 1:1 program helped create a level playing field for all students during the school day.

At the start of the COVID-19 pandemic in spring 2020, all students began remote learning, and most students continued to learn remotely for SY 2020-21. While the district's 1:1 program for all 9-12 students helped, the lack of digital equity in the CPS community greatly impacted students'

ability to participate in their education during this time. During this time, approximately 500 of CPS's 7,000 students were identified as not having adequate internet access at home for full participation in online learning activities. CPS acted to address their community's digital equity needs during this time by

- distributing school-owned laptops to every PreK-12th grade student;
- distributing school-funded hotspots, assigned to one school laptop, to 500 students that requested one; and
- offering city-paid broadband accounts to all eligible families that received a hotspot, then expanding this offer to all eligible families in fall 2021.

Once all students were able to return to school for in-person learning in fall 2021, students in grades 6-12 could take their school-owned devices home. Additionally, any PK-12 student that did not have broadband internet access at home could apply for a broadband plan paid with funds from the Federal Communications Commission's (FCC's) Emergency Connectivity Fund (ECF).³⁶

Collaboration and Partnership

The City of Cambridge, of which the schools are a department, has launched an extensive Digital Equity project. The city defines digital equity as having four elements:

- Access—That broadband infrastructure exists and reliable high-speed broadband plans are available for purchase.
- Affordability—That broadband service is not only available but can be obtained at reasonable prices by all.
- Devices—That residents own or have access to well-functioning, up-to-date computers and can maintain and replace these devices if needed.
- Skills—That residents can make full use of the often-complex functions and computers and online resources and thus can use these tools to communicate, work, learn, attend medical appointments, and so on, and avoid online harm.

A study, *Digital Equity in Cambridge: Data and Strategic Recommendations*, was commissioned to develop a complete, clear understanding of the problems preventing residents from obtaining and effectively using broadband, and to suggest solutions for the city to consider related to broadband access, affordability, device ownership, and digital skills.³⁷

The City of Cambridge is working closely with the school department and many partners, both public and private, to address all the city's digital equity needs. A comprehensive plan is being developed to address digital equity. Potential areas of focus include private internet service, public internet service, city-owned infrastructure, community partners offering culturally responsive family support services to address digital equity, designated city digital equity office and staff, digital access helpline and helpdesk, and more.

Lessons Learned: Taking a Personalized Approach

CPS realized early on that the technical side of digital equity—providing affordable access to devices, broadband, and skill development opportunities—is not the most difficult part of digital equity. Instead, the social aspect of digital equity solutions, that is, a nuanced approach that addresses each family's unique needs, can often be the most difficult piece.

³⁶ Federal Communications Commission. (December 2021). *Emergency Connectivity Fund*. Retrieved January 5, 2022, from <https://www.fcc.gov/emergency-connectivity-fund>.

³⁷ CTC Technology. (March 2021). *Digital Equity in Cambridge: Data and Strategic Recommendations*. Retrieved January 4, 2022, from <https://www.cambridgema.gov/news/2021/04/cityofcambridge-releases-comprehensive-digital-equity-study>.

There are many factors, oftentimes intangible, that influence and impact a family’s ability to be connected. Whether it be language differences, cultural norms, family structures, fear of authority figures, skepticism about free programs, lack of trust, home layouts and construction, or neighborhood features, each of these barriers can halt the work to achieving digital equity. Regarding these last two points, even densely built urban and suburban areas with a high general level of internet access may pose digital equity challenges for some residents—homes and buildings may be built in such a way, or of such materials, that their construction materials interfere with cell phone hotspots, in-home Wi-Fi, and public Wi-Fi.

There is no “one size fits all” solution to digital equity. Digital equity involves

- meeting families where they are;
- understanding their unique needs;
- providing them with individualized support; and
- helping them get connected in a meaningful way.

CPS has found that to truly address digital equity issues, each family must be handled as a unique case with circumstances that need to be considered. Digital equity means meeting families where they are and providing them with the individualized support they need to be connected in a meaningful way. Much like assigning a caseworker to deal with social service issues, a digital equity caseworker may be needed. In practice, this would involve assigning a caseworker who understands the family’s culture and speaks their language to work with the family; identifying their digital access issues, needs, and potential solutions; and helping them navigate all the barriers to achieving equitable access. This type of service, while difficult to implement in practice, is critical to ensuring digital equity for all.

Loudoun County Public Schools (VA): Different Solutions in a Student-Centered Culture

Loudoun County Public Schools’ (VA) (LCPS) culture of prioritizing students and their needs, using robust data analytics to inform decision-making, and quickly putting ideas into action has been crucial to the success of its digital equity efforts.

Context

LCPS has the characteristics of two counties in one: urban communities with 15 high schools in the east, adjacent to the Washington, DC metro area, and a rural west with only two high schools. Each region’s student enrollment and demographics are different, as are the connectivity options available to households. The eastern region has multiple internet service providers (ISPs) to choose from for internet coverage, compared to parts of the western region, where several thousand households had poor internet access or none. These differences posed challenges unique to each part of the division and called for LCPS to take two separate approaches to digital equity. In the east, LCPS used its resources to provide connectivity to students with socio-economic needs; in the west, LCPS allocated resources to bringing service to students in areas without reliable access.

The Department of Digital Innovation (DDI) at LCPS has played a key role in much of the division’s digital equity work. DDI provides leadership for developing and implementing digital innovation initiatives for meaningful, effective, and secure uses of technology throughout the school system. DDI consists of three divisions—Digital Experience, Enterprise Solutions, and Infrastructure and Engineering—with a staff of 240 members. The Loudoun County School Board is the official policy-making body of LCPS and has supported efforts to connect the school community to the resources they need to succeed.

Connecting Students

Before the COVID-19 pandemic, the division was in year two of a three-year project to ensure students in grades 3-12 had access to a division-provided device. As the pandemic began to interrupt school operations in March 2020, LCPS worked quickly to secure devices from vendors. LCPS's 1:1 device distribution goal began with the deployment of laptops to students in grades 3 through 12 who did not yet have a division-provided device as of March 2020. Pre-K through grade 2 students received devices by August 2020, resulting in every student beginning the 2020-21 SY with a division-provided device of their own. The division's rollout of its device program was student-centered and seen as a success within the community, which helped drive the adoption of the program and generate support from decision-makers and stakeholders.

Connecting students to the Internet was more challenging due to the geographic diversity of the division. External-powered Wi-Fi routers were distributed throughout the division to serve as Wi-Fi hubs. The division also opened internet cafés for students and expanded the reach of wireless coverage within school buildings so that students could connect from parking lots outside the building if needed. LCPS partnered with the county government to provide additional locations for internet access and extend Wi-Fi access outside of libraries and other county facilities in the west. Hotspot providers and ISPs were also responsive to county needs, setting up cell towers on wheels in county-acquired parking spots, constantly working to boost signals, and providing real coverage maps.

LCPS acquired hotspots with Children's Internet Protection Act (CIPA) compliant content filters to distribute to students who lacked home internet. Taking an agency-wide approach, DDI partnered with the Parent Liaison Program to identify students in need of a hotspot. The division made use of on-demand language interpretation and translation services to connect with families as well. Rather than taking a first-come, first-serve approach to fulfilling requests, LCPS prioritized device allocations based on need. Data on which students qualified for free or reduced-price lunch (FRPL) or McKinney-Vento Homeless Assistance Act services, as well as household data, were used to inform decision-making and prioritize students who needed access. LCPS initially deployed one hotspot per household; upon finding this allocation insufficient for households with multiple students and multifamily households, LCPS expanded its hotspot distribution to accommodate those residences. In the western part of the division where connectivity was often lacking, staff provided hotspots via contactless drop-off, testing multiple types of hotspots outside of each household to identify the best one for that location.

Students were able to keep their division-provided hotspots after they returned to in-person learning in school, paid for with funds from the FCC's ECF.³⁸ Usage data show that the hotspots continue to be utilized, both during afterschool hours and when individual schools and classes are closed due to COVID-19. The pandemic expedited the division's goal to provide students with internet connectivity options and devices, and LCPS will continue to pursue this goal moving forward. Every student will continue to have access to an LCPS-provided device, and the division is exploring how to continue to provide hotspots after emergency funding expires.

Connecting Staff

Before the pandemic, all teachers had a school-provided device, but other staff, including teaching assistants, used shared devices on-site in school facilities. Once LCPS switched to remote working, the division needed to figure out how to deploy laptops to staff without a dedicated device, as well as teachers who had a desktop in their classroom but needed a laptop for at-home use. The division initially provided the same laptops as those provided to students,

38 Federal Communications Commission. (December 2021). *Emergency Connectivity Fund*. Retrieved January 5, 2022, from <https://www.fcc.gov/emergency-connectivity-fund>.



but quickly had to upgrade to more robust devices and expand its licenses to support the full range of staff duties and tasks.

Gaps in staff access to the Internet were more challenging to address because some LCPS staff live outside of Loudoun County in neighboring counties and states, including Maryland, West Virginia, Pennsylvania, and Washington, DC. LCPS did a small deployment of hotspots for staff, but primarily focused on expanding staff access within school buildings. If staff did not have sufficient internet access at home, they could come into a school facility and have their own room with high-speed connectivity. In some cases, teachers would bring their own children to school with them, thus serving both parent and child internet needs; a parent would teach their own class virtually, and their child would attend their own virtual class.

Providing Support

Information technology (IT) support was provided to all stakeholders—students, families, staff, and administrators—as all parties adapted to remote learning, teaching, and working. The board acted swiftly to procure full software licenses for students and staff, including several bundled cloud computing, productivity, and collaboration software suites. LCPS implemented a new division-wide learning management system (LMS) for consistency, which helped with the switch from in-person to remote teaching and learning. LCPS opened 14 device repair centers throughout the county and aimed to repair devices speedily to minimize interruptions to teaching, learning, and working.

Before the pandemic, LCPS's IT phone support was provided by four staff who would handle an average of 100 calls per day from staff. Once LCPS was fully remote, IT phone support grew to 40 staff who would address approximately 2,000 calls per day from students, families, staff, and administrators. Division IT leaders met every Monday to make staffing allocation decisions, assessing call metrics from the previous week to determine staff assignments for the coming week. To manage the rapid influx of demand for phone support, LCPS provided multilingual support, procured call center software to better route calls, and used remote desktop software to resolve issues. The division also implemented a process for validating student IDs to verify they were talking to the correct LCPS student or parent.

The extension of phone support to students and families was challenging, but rewarding, for staff. After all, having to translate sometimes complex technical instructions into easy steps that the youngest users could follow required a new way of approaching users' IT needs. This experience has shifted DDI's outlook on its role in education—DDI does not just address the technology needs of LCPS, DDI strives to support students in every way possible. This has resulted in staff taking on new responsibilities and assignments when necessary, such as substitute teaching during periods of high teacher absences due to a spike in COVID-19 cases.

Using Data to Chart a Path Forward

LCPS had digital equity data for several years before the pandemic, collected via a technology survey that fed into a data analytics platform. These data helped inform the division's initial decision-making in the early months of the pandemic. During the pandemic, the division primarily focused its digital equity data collection efforts on internet connectivity. Data on student access to devices were not needed because the division provided a device to every student. In comparing survey responses from before and during the pandemic, perceptions of slow internet speeds increased from 3 percent to 12 percent. This was revealing for division leaders and helped motivate action to not only provide internet access but to enhance connectivity speed as well. Data on connectivity were also available via partnerships with the Loudoun County Communications Commission and Loudoun Broadband Alliance.



LCPS avoided a mass of data requests thanks to the analytics platform created by DDI's Enterprise Solutions team. The analytics platform provides many useful data visualizations and allows for self-service. By triangulating and centralizing data into one authoritative source, the platform has improved the accuracy and understanding of data across the agency. This platform has proved essential, with all agency decision-makers leveraging the information and tools provided to make data-informed decisions. LCPS was fortunate to already have this solid infrastructure and battery of tools in place well before the pandemic, which enabled responses to new data needs. The robustness of these tools has helped increase data literacy, with the unexpected, but welcome, effect of encouraging data requestors to ask deeper, more meaningful, and sophisticated questions.

Data are regularly reviewed during board meetings to enhance understanding and decision-making. For example, in early 2022 the board was presented with data showing device and hotspot usage at different grade levels, including the amount of time spent on devices, what types of websites are being accessed, and how many websites are blocked by content filters. Usage data showed that students in grades 9-12 visited 50 million websites in one month; of these, 79 percent were educational websites, and 2 percent were blocked by the division's robust content filters. These types of metrics demonstrate that division devices and hotspots remain well-used and also remain an effective return on investment.

Culture Drives Success

From its experience with the COVID-19 pandemic, LCPS learned that putting ideas into action as quickly as possible is key. Rapid response and an openness to new ideas allowed the LEA to deal with unforeseen challenges and changes to plans. When the division saw gaps in access, it worked quickly to deploy potential solutions. The division knew that if it delayed decision-making in the interest of finding a faultless solution, students would suffer in the interim. This drive to move forward, address challenges head-on, and make iterative adjustments along the way based on lessons learned has been crucial to the division's success.

Staff dedication to students has also been critical to the division's digital equity efforts. Although the pandemic has been stressful for all, the division's perseverance in the face of challenging circumstances has led to many rewarding experiences. DDI staff have received recognition from the board and school community for their commitment to closing digital equity gaps, which has boosted morale, engendered a sense of pride, and built momentum for tackling new and existing barriers. Based on its experiences during the pandemic, the DDI team has adopted a more holistic, student-centered approach to its role, making them even more integral to the division's success in educating students.

Maryland State Department of Education and Caroline County Public Schools (MD): State and Local Experiences Addressing Digital Equity

SEAs and LEAs often face the same challenges to achieving digital equity, but take different approaches because of their unique respective positions. In Maryland, the SEA collected the necessary information to understand and then act to close digital equity gaps, while LEAs expanded the availability and use of educational technology to meet students' digital equity needs.

Bringing State and Local Agencies Together

Throughout the COVID-19 pandemic, the Maryland State Department of Education (MSDE) organized weekly and monthly meetings for LEAs to convene and share their experiences, focusing on sharing successes and brainstorming strategies to help students, families, and their communities. LEAs worked to ensure students had the resources and support they need to

continue learning from home, with some going as far as hand-delivering instructional packets and devices to students' homes. Rather than assume that students have the connectivity needed to learn from home, LEAs acted and spent funds to provide students with hotspots and enable Wi-Fi access at community centers. One helpful procurement was a telephone app (that works on smartphones and computers) with several free features, including a translation feature that has helped LEAs maintain communication with English learners (EL) and their families. While every LEA had or implemented a 1:1 device program, LEAs still report that internet gaps persist. To that end, MDSE is working with ISPs to provide free or low-cost internet to help ensure all students have access to an affordable broadband internet connection.

State Perspective

As the COVID-19 pandemic forced schools to switch from in-person to remote learning, MSDE identified a need for digital equity information from LEAs through conversations with stakeholders. MSDE conducted a remote learning survey in April 2020, one month after schools had closed. In June 2020, a follow-up survey was conducted to gather more recent information to aid in calculating estimates for federal and state emergency pandemic funding for technology needs. Both the Maryland State Board of Education and Maryland General Assembly approached MSDE leadership in the subsequent months with a request for more comprehensive information on the digital inequities that were impeding continuity of learning during the COVID-19 pandemic.

In September 2020, MSDE and the Public School Superintendents Association of Maryland (PSSAM) jointly convened a workgroup comprising the MSDE Deputy State Superintendent for Teaching and Learning, the PSSAM Executive Director, MSDE staff, and LEA staff including assistant superintendents, chief information officers (CIOs), and chief financial officers (CFOs). The workgroup met several times over one week to develop a survey that could be used to identify and quantify technology-related gaps, while minimizing data burden. The workgroup helped prepare LEAs for the survey and fielded inquiries about the data

Technology Survey Topic Areas

- Student digital learning devices
- Continuity of learning
- Sustainability
- Digital access and connectivity
- Staff digital devices
- Professional development
- Digital platforms and tools
- Supporting vulnerable students

and how they would be used to address digital equity gaps. The survey included 109 questions in eight topic areas. The survey was disseminated in October 2020 through the Maryland K12 Technology Leadership Forum's CIO/Director group (consisting of Maryland LEA IT department leaders), who then worked with staff in their agencies to collect the data.

The information from the survey was provided to the SEA leadership team and to the General Assembly, both of which wanted actionable data to inform decision-making. The results of the survey were also presented to the State Board during an update on the status of schools and their ability to provide high-quality instruction in a virtual setting. The need for information on technology was reflected in the Blueprint for Maryland's Future,³⁹ which includes comprehensive changes to Maryland's early childhood and public schools. The legislation passed in 2021 contains certain provisions, dedicated funding, and target per-pupil foundation amounts for educational technology, including digital devices, broadband connectivity, and IT staff.

A revealing insight from the survey was that inequity is not always obvious. Even in places that appeared to have widespread internet access, LEAs reported two primary issues: a pervasive

39 Maryland State Department of Education. (2022). *Blueprint for Maryland's Future*. Retrieved March 1, 2022, from <https://www.marylandpublicschools.org/Blueprint/Pages/Overview.aspx>.

lack of affordability, and pockets of inadequate or nonexistent broadband infrastructure in both urban and rural settings. Affordability barriers are being addressed by the state through work with ISPs and the use of federal funds awarded as part of the Elementary and Secondary School Emergency Relief Fund (ESSER). Additionally, the One Maryland Broadband Network Infrastructure⁴⁰ will fill infrastructure gaps by extending the state's broadband infrastructure to create a 1,294-mile fiber-optic broadband network that will link 1,006 government facilities and community anchor institutions⁴¹ in every county in the state. The network will also interconnect and extend three independent networks through a public/private consortium that will include three primary partners:

- the State of Maryland's networkMaryland, the statewide network operated by the Department of Information Technology;
- the Inter-County Broadband Network (ICBN), a consortium of 9 central Maryland counties and cities; and
- the Maryland Broadband Cooperative (MDBC), a rural non-profit carrier.

Local Perspective

Caroline County Public Schools (MD) (CCPS) serves over 5,500 students in pre-kindergarten through 12th grade in a rural, agricultural county located on Maryland's Eastern Shore. To ensure continuity of learning during school closures caused by the COVID-19 pandemic, the LEA switched to remote learning and sent paper packets home with all prekindergarten and kindergarten (PreK-K) students.

CCPS undertook a process to identify the extent to which students had internet access. The superintendent and supervisory team sent a survey to families to collect information on connectivity and devices. CCPS also identified areas in the county where no ISPs offered broadband internet. CCPS allocated funding to provide hotspots, laptops, and other internet-connected devices to students so they could participate in virtual and hybrid learning.

CCPS also conducted a county-wide inventory of all available devices, including school lab carts with tablets and laptops. The LEA then allocated devices to all students who needed them, regardless of whether the device was sourced from the student's school. Supply chain issues initially delayed order fulfillments, but by the time all students returned to school in spring 2021, CCPS had procured enough devices to be a fully 1:1 district. Content supervisors took part in the decision regarding which type of device each grade should receive. All K-3 grade students were issued a school-provided tablet, while all 4-12 grade students received a school-provided laptop that provides more functionality for virtual and in-person learning.

Every student brings their device to the classroom and uses it for educational purposes during certain times in the school day. For example, upper-grade students might use their school-provided laptops to access an educational application for supplementary learning. Each school has a cart with extra devices on hand so that if a device breaks or is forgotten at home, students can sign out a loaner device and continue learning in class with their peers.

The LEA received approximately \$17 million from ESSER,⁴² a portion of which was used by the LEA's Special Programs (serving students with disabilities, ELs, gifted and talented students, and

40 Maryland Department of Information Technology. (n.d.). *One Maryland Broadband Network*. Retrieved March 1, 2022, from <https://doit.maryland.gov/ombn/Pages/ombnHome.aspx>.

41 Community anchor institutions includes such entities as schools, libraries, hospitals and other medical providers, public safety entities, institutions of higher education, and community support organizations that facilitate greater use of broadband by vulnerable populations, including low-income, the unemployed, and the aged.

42 U.S. Department of Education. (n.d.). *Education Stabilization Fund Transparency Portal*. Retrieved March 1, 2022, from <https://covid-relief-data.ed.gov/profile/entity/610013724>.



infants and toddlers) to develop a plan to return to in-person learning. While the goal was for all special program students to return to in-person learning, the LEA continued to accommodate a small portion of students whose families elected to continue with remote learning.

Good communication has been of critical importance during the pandemic, especially for EL students and multilingual families. For example, when new EL students and families needed assistance navigating CCPS's blended learning platform, the LEA worked to ensure that all students learned how to use the platform so they would be prepared to engage in virtual learning due to inclement weather or illness. CCPS also dedicated efforts to ensuring strong home-to-school connections for EL students. Teachers used a language interpretation service and a telephone app equipped with a translation feature to communicate with families after hours. CCPS also added a new position for a bilingual parent liaison to help the home-to-school connection. The liaison is assigned to the school with the largest population of Spanish-speaking students but works with students across the district to provide a point of stability for students' families when they progress to another school.

As a small LEA in a rural part of the state, CCPS has strived to make the most of the funding available to create more digital equity. The Caroline County community has pooled its resources and worked together to expand internet infrastructure and access, pursuing a shared goal of making sure that all students can receive the education they need. CCPS schools, the Caroline County Public Library, county government facilities, and community partners installed new devices or expanded existing Wi-Fi networks so the Internet could be accessed in parking lots during and after school hours.

While additional work is needed to eradicate digital inequity, the Caroline County community has made great strides in addressing digital equity challenges. Looking ahead, CCPS has begun planning for the implementation of the Blueprint for Maryland's Future. The Blueprint's dedicated funding for educational technology will help sustain the progress CCPS and other Maryland LEAs have made to close the digital divide.

Noblesville Schools (IN): Digital Education for Equitable Learning


For Noblesville Schools (IN), internet and device access are not the sole focus of its digital equity efforts. Teaching and learning with digital resources is also an essential piece of the puzzle. The district's definition of digital equity is multipronged and includes technical, social, and pedagogical components:

- reliable broadband and devices that support full participation in synchronous online learning;
- IT support for students and families;
- high-quality digital curriculum and well-designed, research-based online learning opportunities; and
- staff who are trained to successfully deliver educational outcomes, regardless of learning modality.

Collecting Data on the Front Lines

The district has collected digital equity data for some time through informal local surveys on student access to devices. However, online digital equity surveys have limitations because only those who are already connected can respond to them.

Once the pandemic began, the district quickly realized that not seeing students face-to-face every day made it more difficult to identify which students needed support. Often, the first points of contact for students and their families—teachers, counselors, social workers, and



administrators—were the best sources of information on which students were facing digital inequities. Students, particularly those who are low-income or ELs, often face many more hurdles to participating in online learning. Staff who most commonly interact with students are often the first to notice if a student is facing a digital equity barrier, and are also the best equipped to work with those who have digital equity needs. The personal relationships that these front-line staff have with students can make the difference in ensuring students have the access they need to succeed.

After the pandemic began, the Indiana Department of Education initiated a broadband internet data collection at the request of the state legislature. The collection required Indiana schools to collect data on access to high-quality broadband as part of the student enrollment process. Student feedback on their online learning experiences has also provided insight into the types of digital equity barriers they are experiencing.

Meeting Immediate Needs

The pandemic forced Noblesville Schools (IN) to confront digital inequities within the district. Families who previously relied on internet access through the library or free public Wi-Fi were unable to do so, especially during the early months of the pandemic when many public buildings and private businesses were closed. The district knew that students who are unable to participate in fully remote learning not only lose out on required academic activities that take place online outside of school but also lose out on the social components of interacting with other students and their teachers. Digital inequity also places a lot of stress on educators. More immediately, teachers often must devote time to ensuring students have connectivity and a device and to helping those students without access to catch up. In the longer term, teachers are ultimately held accountable for student success, even if their success is hindered by digital inequity.

Noblesville Schools (IN) needed to quickly close access gaps, scale up the capacity of instructional staff, and bolster its digital curriculum offerings to ensure students had access to high-quality online learning experiences. The district took several steps to ramp up its digital equity efforts, such as:

- using federal funding to refresh its device program and digital curriculum;
- deploying mobile hotspots to students with limited or no internet access at home;
- providing professional development (PD) on designing high-quality digital learning; and
- increasing staff capacity to support students at home.

Addressing Persistent Challenges

Several challenges had to be overcome as Noblesville Schools (IN) sought to find answers to digital inequity in the district.

- **Broadband Limitations**—Continuing limitations with mobile hotspots have hindered the ability of some users to connect and participate online. To identify and address broadband access gaps, Hamilton County, Indiana convened a Broadband Task Force. The task force included a representative from Noblesville Schools (IN), as well as other stakeholders in the county, including other school districts, government agencies, and the public and private sectors. The task force conducted a broadband survey⁴³ and worked collaboratively to collect data on where broadband access is not available. These data were used to create Hamilton County broadband maps with support from

43 Hamilton County Broadband Task Force. (n.d.). *Hamilton County - Broadband Survey*. Retrieved January 13, 2022, from https://www.surveymonkey.com/r/Preview/?sm=vpu8_2BpkmRHJ2RDlm_2B_2FCaoQ4KsNmMboImUnH2ZHAEMdJZWeOPRRxIXgWuSmZCrSuG.

a public university in Indiana. In turn, policymakers have incentivized the industry to expand broadband to areas identified by the task force. By treating broadband as an essential service, the task force is working to get broadband into all homes within Hamilton County.

- **Digital Literacy**—Many elementary students need assistance or supervision from a caregiver to participate in online learning. To support caregivers who assist PreK-5 students with online learning, the district developed a handbook for caregivers, before- and after-school site leaders, and public library staff.⁴⁴ The handbook includes instructions on how to access the district’s single-sign-on (SSO) solution, LMSs, digital resources, and parent portal, along with public library resources. Troubleshooting information for district devices and contact information for the district’s HelpDesk (<https://www.noblesvilleschools.org/Page/7055>) is also provided. The handbook was posted online, mailed out in letters, and disseminated via the district’s communications system.
- **Accessibility**—Universal design, designing for accessibility, and making online materials accessible for all students and caregivers have been difficult. Locally developed PD materials on digital curriculum, online learning, accessibility, and assessment; guidelines from the Indiana Department of Education on teaching and learning online; and resources from professional associations on Universal Design for Learning (UDL), designing accessible learning materials, and blended learning have helped teachers and instructional coaches develop quality online learning experiences.
- **Shifting to an Online Setting**—Many facets of educational operations are designed around face-to-face interaction; everything from instruction, accountability, and measurement metrics to PD and teacher preparation are all designed for an in-person environment. As a result, district staff needed to work industriously to build capacity online. The district’s efforts to strengthen its digital capabilities have helped it face existing and emerging challenges as the pandemic continued to disrupt operations throughout the 2020-21 and 2021-22 SYs. Students who must quarantine due to possible COVID-19 exposure can stay connected online and continue their learning from home. Similarly, teachers can continue educating their students despite not being present in person. Educators are now more skilled at creating engaging digital learning experiences and online curricula than at the start of the pandemic in March 2020. Moving forward, these experiences will help teachers equip all students with the technology and digital literacy skills they need to succeed.

Noblesville Schools (IN) educators are now skilled at creating accessible and engaging digital learning experiences and online curricula that equip all students with the technology and digital literacy skills they need to succeed.

Northshore School District (WA): Building Relationships for Enduring Equity

Northshore School District (WA) (NSD), the first district in the nation to close physical schools due to the COVID-19 pandemic, was alert to the changing conditions and needs of its community since the very beginning of remote learning, and its approach to digital equity has evolved in response to them. Recognition of the importance of providing students and families with

⁴⁴ Noblesville Schools. (n.d.). *PreK-5 Online Learning Handbook for Caregivers, Miller Explorers Site Leaders, and Public Library Staff*. Retrieved January 13, 2022, from https://docs.google.com/presentation/d/e/2PACX-ivTaBO5Cxc2Cz40YgmpQe-AYrhZ5x2gmcie1M7JWLQlTaoJlJU6_FHCWdfUFhvkCXuyp_hN69jev4P1/pub?start=false&loop=false&delays=3000&slide=id.p.



a device, connectivity, training, and support, coupled with an organizational culture of collaboration, has helped NSD navigate a path forward.

Starting with a Personalized Approach

In the years before the COVID-19 pandemic, NSD created a small-scale “school-to-home” program for students facing digital access challenges at home. Whereas some LEAs had comprehensive 1:1 device distribution, NSD adopted a more personalized approach tailored to equip students with the necessary hardware, connectivity, and knowledge to use a district-provided device at home. Agency staff, including student services staff, counselors, family advocates, and administrators, identified a subset of students across demographics and socioeconomic statuses who could benefit from the program. Once students were identified for the program, student services staff scheduled personal interviews with them. These appointments allowed staff to confirm that a student would benefit from the program and, upon confirmation, to provide individualized instruction to the student on how to use their school-provided device responsibly.

Recognizing that providing students with devices would be insufficient without a reliable broadband connection at home, households with inadequate internet access were provided with hotspots. All district-provided hotspots were set up with content filters enabled, but NDS decided to not limit hotspot access to school-provided devices. The decision to leave hotspot access open to others in the household had the benefit of helping families, who could now access educational resources and public services to improve their quality of life. This, in turn, has improved the students’ lives as well. In some cases, students would adopt the role of household “tech expert” and assist family members who were unfamiliar with technology.

Ramping up to Respond to a Crisis

In late February 2020, NSD’s Bothell High School became the first school in the United States to close its doors to in-person learning after a reported instance of exposure to COVID-19. In response to the quickly evolving situation, district leaders convened over a single weekend to determine how to move all district instruction online. The LEA faced several obstacles in coming to this decision, given that the schools had no large-scale plan to make sure all students had home access to internet-connected devices. The personalized approach of the school-to-home program, while successful at meeting the needs of a subset of students, was not scalable at a time when quarantining, social distancing, and stay-at-home orders became the norm. Part of the district’s early success in switching to remote learning can be attributed to the experience, skills, and confidence of the instructional technology team, who quickly developed a plan to distribute devices and hotspots as district leaders were planning the switch to remote learning. The LEA’s task was also eased by the high number of students who already had access to the Internet and personal electronic devices at home. NSD’s experience with the school-to-home program equipped staff with an understanding of how to fill the access gaps some students continued to face at home.

As the first LEA in the nation to pause in-person learning because of COVID-19, NSD had the advantage of being at the head of the queue when it needed to work with suppliers to expedite hotspot and device procurement. Initially, NSD did not elect to deploy a standard, district-issued device to every student. If a family felt their personal device(s) were adequate for remote learning, they were welcome to use those devices. Families who needed devices were able to submit requests to the school for the LEA to fulfill. NSD received many such requests in spring 2020 and distributed approximately 550 hotspots and 5,000 devices to the 23,500 students throughout its schools. The district quickly developed training documentation, resources, and supports to ensure students could use the technology provided to them. Translating these resources into multiple languages was challenging, but this work helped strengthen



relationships between the technology department and the liaisons and family advocates who work with EL families. These relationships played a key role in preparing for the SY starting in fall 2020.

Expanding Access and Supports

In SY 2020-21, NSD revamped its approach to distributing devices and hotspots based on its experiences. At the start of the SY, requests for both devices and hotspots were higher than the district had anticipated, based on their experience from the past year. In some cases, families that needed a device or hotspot had not requested one the prior year. Other families had not requested enough devices or hotspots for all the students in their households. These families had initially elected to manage with what they already had at home. But facing another SY involving remote learning, the families reconsidered that decision. Approximately 1,300 additional hotspots and 7,000 additional devices were distributed in fall 2020.

In response, instead of requiring families to request a device, the district developed a plan to implement a full 1:1 program and distribute the same devices and core set of software and tools to all students. Some accommodations were necessary; for example, students in special programs sometimes received a different type of device with specialized software and features necessary for completing their required coursework and assessments.

The move to a full 1:1 program has benefitted many in the NSD community:

- All students received the same devices, software, and tools needed for learning.
- Families were not burdened with having to request a device for their students.
- Teachers were better able to plan for remote learning and education technology use.
- The IT team could more easily service and support student devices.

Providing students and teachers with access to current, reliable technology and digital resources has helped NSD students when learning at home, as well as upon their return to in-person learning in school buildings.

While the program has been successful, accountability for devices remains a challenge. The district has strived to achieve a balance between ensuring that students and families take responsibility for their school-provided devices, while also minimizing the delay in providing students with a device when the district's Responsible Use Agreement has not yet been signed by the family. The district is accounting for potential device breakage in its fiscal planning to make sure the 1:1 program is funded appropriately. To help minimize the risk of physical damage to devices, students are provided with a reinforced bag to protect their devices. NSD maintains a reserve pool so students can swap out their devices when repairs are needed and has allocated daily loaner devices for students who come to school and leave their devices at home.

Strengthening Collaborative Partnerships

A shared understanding of the importance of digital equity, coupled with organizational structures that enable intra-agency relationships, has allowed NSD to leverage resources across the LEA's many departments and teams. Throughout the COVID-19 pandemic, NSD has drawn upon existing partnerships within the district to equitably support students and families. Working collaboratively across departments has strengthened relationships within the NSD community and expanded the impact and reach of the district's efforts.

- **Bridging language barriers**—At the start of SY 2020-21, the technology, student services, and racial and educational justice teams collaborated on a series of virtual training workshops to help prepare families for continued remote learning. The workshops were supported in multiple languages (including Ukrainian, Tamil, and

Spanish)—one part of the workshop would be offered in English, then the same information would be relayed in another language. Staff also facilitated multilingual discussions in the chat and translated questions and information between families and English-speaking staff. A high percentage of families used a district-provided device to participate in the workshops, demonstrating the value of providing devices to students. These workshops bolstered district-parent relationships and built trust within the NSD community. Although the district did not provide this type of training at the start of SY 2021-22 when students returned to in-person learning, NSD hopes to provide similar workshops in the future.

- **Utilizing transferable skills**—Due to working with students and families on the road every day before remote learning, NSD bus drivers have acquired transferable communication skills and experience that have enabled them to take on new roles. Once NSD switched to remote learning and students no longer needed transportation to and from school, bus drivers were reassigned to support students and families in different ways. Some drivers supported the district’s remote library services and food services. Instead of transporting students, buses would deliver meals, as well as items that students and families requested from school libraries. Other bus drivers were cross-trained to work the NSD Technology Help Desk. These staff triaged calls and provided basic technical support to students and families using their district devices at home; they also escalated advanced technical assistance queries to technology department staff. Other bus drivers worked with the communications department or filled in as school technology specialists.
- **Targeting support**—NSD’s food services and communications departments were essential to the expansion of internet access to families in the district. Food services staff used FRPL program data to identify students whose families were eligible for federal, state, or local programs that provided low- or no-cost internet service to families and households. The food services and communications departments then worked together to advertise these programs to families and encourage them to apply. Family advocates have also played an essential role in supporting families throughout the pandemic. During NSD’s remote learning operation, family advocates provided one-on-one support in families’ homes and helped families navigate accessibility issues, language barriers, and technical challenges.

Looking Ahead

NSD has made great strides to address students’ digital equity needs. Now that the district has an established 1:1 program that will continue in the future, other aspects of equity beyond access and connectivity are being considered.

- **Language needs**—NSD staff are familiar with translation tools and ways to adapt materials to other languages. Now that all students have access to the same devices, teachers and staff can be agile in addressing students’ language needs and breaking down barriers.
- **Assistive and adaptive technology**—NSD’s instructional and student services leaders are examining the district’s technology, support, training, and systems to ensure that these resources are fully leveraged to close the digital equity gap at home. Of particular focus is making the best use of assistive and adaptive technology to meet the needs of students with disabilities.

- **Scheduling considerations**—While all students now have access to a device that they can use for their homework, students have varying responsibilities and obligations (such as caring for family members or working outside the home) that can impact the amount of time they have to complete their homework. Leaders are considering how to ensure homework does not place an undue burden on certain students.

West Virginia Department of Education: Connecting Kids for Learning Continuity

West Virginia Kids Connect (<https://wvkidsconnect.net/>) installed the necessary equipment to turn all public schools, higher education institutions, county libraries, and state parks into Wi-Fi hotspots to support the learning needs of children without access to the Internet in their homes.

Barriers to Community Connectivity

The West Virginia Department of Education has received Universal Service Program for Schools and Libraries (E-Rate) funding to expand high-speed broadband in West Virginia schools. While successful, expanding connectivity in schools did not address the need to bring local communities the internet access their students need for homework and remote learning.

Community-wide broadband is limited in West Virginia. Cellphone towers and broadband connections are plentiful within the state's largest population centers bordering the east and along interstate highways, but connectivity quickly drops off just a few miles outside of these areas. The state's mountainous ranges and low valleys make broadband connections difficult and inhibit fixed wireless solutions and satellite internet signals. Connecting the state's many rural areas would require a sizable upfront investment with only negligible revenue as a result. Additionally, West Virginia households within the National Radio Quiet Zone are restricted in their use of Wi-Fi.

Collaboration and Cooperation

When schools in West Virginia closed in March 2020 due to the COVID-19 pandemic, remote learning became a necessary option for the state's students; however, for those students who lacked internet access at home, remote learning was an obstacle. The need for expanded student access to the Internet outside school buildings was evident to all core stakeholders, including the West Virginia Legislature, the West Virginia Department of Education (WVDE) and local districts and schools, the West Virginia Higher Education Policy Commission (WVHEPC), the West Virginia Office of Technology (WVOT), the West Virginia Infrastructure and Jobs Development Council, and community members.

Representatives from WVDE, WVHEPC, and WVOT began meeting regularly to brainstorm and discuss how to expand internet access to all K-12 and postsecondary students in the state. The spark of a solution appeared when some schools moved their internal wireless access points closer to windows so that students could access the Internet from outside of the building—could wireless internet access points be installed outside of every school building in the state? Thus, the West Virginia Kids Connect program was born.

WVDE worked with the state legislature to secure funding for the Kids Connect program under the governor's emergency spending order, via a purchasing process well within this order's scope and parameters. Three vendors, who under normal circumstances might have bid against one another, instead developed a partnership to set up and implement the program. Thanks to cooperation between state agencies and the private sector, the program went from inception to implementation in just 90 days. The expansive cooperation by state agencies, the state legislature, vendors, and communities across West Virginia has been essential to the success of the program.

Connecting Students in Their Communities

The West Virginia Kids Connect program is designed to support the learning needs of children who do not have access to the Internet in their homes. External internet access points were installed in publicly accessible parking lots outside of all K-12 public schools, higher education institutions, county libraries, state parks, and national guard armories within West Virginia. In sum, the Kids Connect program provides more than 1,000 wireless hotspots at over 950 wireless connection points across West Virginia.

Each point has signage with a Kids Connect logo to designate the location of the wireless network. The network is open every day from 8:00 a.m. - 10:00 p.m., including weekends and holidays. Although each lot has a limited number of parking spaces, and many simultaneous users may slow the network speed, there is no limit to the number of users who can access the network at one time. To ensure students' physical safety, students under 18 must be accompanied by a parent or an authorized adult and remain in their vehicle at all times. Each location also has its own security arrangement.

Students can use the Kids Connect network to upload and download their course materials and assignments, conduct basic research, and engage in other asynchronous learning activities. The network is not designed for video streaming, video chats, or video conferencing, making it unsuitable for attending synchronous class sessions and viewing prerecorded lectures. Content filters are in place to block inappropriate and noneducational content to keep students safe when online. Access is credential-based to ensure that only authorized students can access the network. In case of travel or relocation, a student's log-in credentials are valid at any of the wireless hotspots within the state. While the network is primarily designed for K-12 students without residential internet service, it can be used by post-secondary students who do not have access to the Internet for their academic assignments.

Looking Ahead

Given the current barriers to connecting West Virginians to the Internet, the Kids Connect program was the state's best solution to support the continuity of student learning during the COVID-19 pandemic. While not a solution that fully addressed students' out-of-school connectivity needs, the Kids Connect program has gone a long way toward meeting these needs safely and securely. As many students have returned to school, the program continues to be used by students who were in a remote learning model on a short-term basis and students who lack connectivity at home to complete after-school learning activities and homework.

The program is set to run for three years under the terms of the original agreement; as this term expires, WVDE will reassess the needs of students and determine whether the program will be continued, and if so, what adjustments will need to be made. Federal funds to expand broadband internet have recently been allocated, but broadband installation and expansion projects take time to materialize. As more West Virginia students begin to get connected, WVDE will be able to determine how to redesign and redeploy the program to meet students' needs.

Wisconsin Department of Public Instruction: Reducing Digital Equity Gaps at the System and Individual Levels

Although digital equity gaps existed before 2020, the COVID-19 pandemic created a new urgency for districts and schools to address digital equity so that all students can fully access school and library resources where they live. In Wisconsin, the Department of Public Instruction's (DPI's) unique role as both the SEA and the state library agency has allowed for the coordination of activities and funding opportunities for Wisconsin schools and libraries to support digital equity for students, their families, and all the citizens of the state.

Before the statewide school closure on March 18, 2020, Wisconsin LEAs monitored digital equity by estimating the number of students that did not have access to devices or the Internet. It was quickly apparent that LEAs and schools could not act on these data to ensure that all students had the resources they needed to make the quick conversion to emergency remote learning. Ensuring access to an internet connection and a dedicated learning device for students where they live became even more important for DPI and LEAs when schools closed to in-person instruction and went fully remote.

During the 2019-20 school year, 421 Wisconsin school districts educated 854,959 students. There are wide variations in the size and setup of Wisconsin's schools; as an illustrative example, the size of district graduating classes the previous year varied from 8 to 7,348 students, with a median graduating class of 144 students.

Leveraging Existing Partnerships

DPI needed to quickly respond and take the lead in developing resources to assist the state's schools and libraries in supporting all Wisconsin students. To achieve this goal, DPI leveraged existing partnerships, tools, and pathways to create new supports while meeting the wide range of district digital equity needs.

DPI developed and released a series of five digital equity data questions that schools could use to gather detailed information for each student during the annual registration process.⁴⁵ These questions were developed in a coordinated effort with three non-profits: one comprised of SEA leaders, one working to close the digital divide, and the third focused on data interoperability. The data elements used to answer these questions are included as data elements in the Common Education Data Standards (CEDs).

With the questions and data elements defined, DPI leveraged a set of existing partnerships with student information system (SIS) providers that serve Wisconsin LEAs. The immediate goal of this effort was to gather and report the digital equity data points to DPI via an application programming interface (API) pipeline. The SIS providers understood the urgency of this need and worked quickly to engineer the products in time for the first optional data collection in fall 2020.

Collecting the Data to Glean Insights

During the summer and fall of 2020, schools started collecting and reporting digital equity data to DPI. While districts are not required by statute to collect and report this data, 298 out of 421 districts reported digital equity data during the initial data collection in fall 2020. In 2021, this number increased to 324. The collection found that some students lacked internet access because of affordability or availability of service. Of those students who reported having internet access where they live, some households responded that they could not stream video for learning at all or without quality interruptions. The data showed that traditionally marginalized student groups were more likely to lack internet access.

Using the Data for System- and Student-level Action

DPI built a publicly available Digital Equity Dashboard (<https://wisedash.dpi.wi.gov/Dashboard/dashboard/22066>) to view and analyze the statewide aggregated digital equity data. DPI also built publicly available Digital Equity Maps (<https://student-internet-access-wi-dpi.hub.arcgis.com/>) to view data by individual school districts. These maps are used by districts to advocate and plan for broadband investments in their community. In some cases, a local broadband task force in collaboration with their school districts has requested aggregated digital equity data by county to contribute to their county needs assessment.

⁴⁵ Wisconsin Department of Public Instruction. (n.d.). *Internet Access at Home Survey*. Retrieved March 22, 2022, from <https://dpi.wi.gov/broadband/internet-access-home-survey>.

In conjunction with the public dashboard, DPI also built Secure Digital Equity Dashboards that LEAs can use to support the individual needs of every student, provide local community partners with critical data needed when submitting broadband grant applications, and fulfill any state or federal reporting requirements that may arise with the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), E-Rate, or other funding.⁴⁶

Public Reporting for Systemic Change

To help schools and libraries target initiatives for better broadband access, DPI partnered with a technology non-profit to conduct statewide broadband speed testing. Schools and libraries across the state reached out to families in their area to test broadband speeds and gather a large set of speed test data. DPI then used those test results to create interactive broadband speed maps for public use.⁴⁷

In April 2021, DPI hosted a broadband expansion webinar for schools, libraries, and other partners to hear from guests about several replicable fiber expansion project models.⁴⁸ Models shared highlighted partnerships with other public entities, including private partnerships, and using any funds that allow for broadband expansion.

DPI created two primary datasets that fed the Digital Equity Maps and dashboards: broadband access and broadband reliability. The data are given as the percentage of student respondents in each district. Counts are not given in the dataset to protect student privacy, as sensitive socio-economic data are included.

Through a data-sharing agreement with the Public Service Commission of Wisconsin (PSC), DPI also provided digital equity datasets to the PSC. The PSC utilized the primary datasets as overlays for the Broadband Expansion Grant Application FY2021 to provide static maps for the PSC commissioners. DPI also provided additional tabular datasets to the PSC, including the number of student responses in each category and the total number of responses. The PSC utilized the additional datasets for internal use only to provide PSC commissioners with additional information to prioritize grant allocation.

In Summer 2021, DPI supported schools and libraries that were submitting applications for the FCC's ECF.⁴⁹ School districts that reported digital equity data were able to use that information in their ECF application to complete the required needs assessment. In total, 426 Wisconsin schools and libraries requested \$82,990,396 in ECF funding. As of March 2022, \$72,484,978.51 in funding requests for Wisconsin schools and libraries has been committed for equipment and internet services. Wisconsin applications are still under review for this funding, and the FCC releases new funding waves on an ongoing basis.

Secure Reporting for Individual Student Needs

Affordability. Concurrent with their work with national partners, SIS vendors, and districts to collect and report digital equity data, DPI developed a series of tools and resources to support schools that want to address the affordability gap by purchasing discounted hardware, software, and internet access for students.

46 Wisconsin Department of Public Instruction. (n.d.). *WISEdash for Districts Digital Equity Dashboard*. Retrieved March 22, 2022, from <https://dpi.wi.gov/wisedash/districts/about-data/digital-equity>.

47 Wisconsin Department of Public Instruction. (n.d.). *Public Speed Test Dashboard and Maps*. Retrieved March 22, 2022, from <https://dpi.wi.gov/broadband/speed-test-maps>.

48 Wisconsin Department of Public Instruction. (n.d.). *Expanding Broadband*. Retrieved March 22, 2022, from <https://dpi.wi.gov/broadband/expanding-broadband>.

49 Federal Communications Commission. (December 2021). *Emergency Connectivity Fund*. Retrieved January 5, 2022, from <https://www.fcc.gov/emergency-connectivity-fund>.

- DPI partnered with CESA Purchasing to develop the Digital Learning Bridge, a resource for schools and libraries to purchase discounted hardware, software, and internet service.⁵⁰ CESA Purchasing is a Wisconsin statewide cooperative that benefits K-12 schools, libraries, and other educational entities by working with over 100 vendors to provide contracts with discounts and other value-added. To help LEAs respond to the COVID-19 pandemic and digital learning gaps, DPI earmarked \$2,000,000 for LEAs to make purchases through the Digital Learning Bridge. This funding could be used to purchase broadband for families or hardware and software that support student learning during the pandemic.
- DPI created a Funding Quick Reference Guide for districts that outlines district and school funding sources, direct-to-consumer internet discount programs, and other funding for public-private broadband expansion projects.⁵¹
- DPI continues to develop resources and tools for districts to address digital equity. Ongoing efforts include providing administrative support for the Wisconsin PSC Universal Service Fund Nonprofit Access Grant Program for private philanthropy. The goal of this pilot project is to develop a pathway for private donors to support internet access for students where they live through Digital Learning Bridge vouchers for schools to purchase internet service plans on behalf of households with an affordability gap.

Access. Wisconsin has over 90 ISPs. To make purchasing decisions and provide internet access where students live, districts need to know which ISPs can serve specific addresses. Using data provided by the PSC, DPI built an ISP-by-district coverage map (<https://wi-dpi.maps.arcgis.com/apps/dashboards/9b32bb6808894d608055cf7d0300d7c7>) to assist districts with identifying ISPs that report coverage within the school district's boundaries.

To provide more detailed information for school districts to meet individual student needs, DPI partnered with a national non-profit to integrate DPI's digital equity data with the non-profit's Home Digital Access mapping tool. The tool displays geographically where students with insufficient internet access are located and links ISP options to specific student addresses.

A team quickly executed several technical solutions to support the integration of the mapping tool. The team constructed data views, scheduled nightly secure transmissions of digital equity data and address data, and gave LEA users authorization. The Wisconsin Information System for Education (WISE) secure team built an application authorization model for LEA district security administrators to grant users access to the tool. The WISE administrative task portal underwent required modifications that allowed LEA district administrators to authorize the use of the digital equity and address data for integration with the non-profit and maps in the WISE dashboard. Integration testing with the non-profit was conducted to ensure a successful rollout of the Home Digital Access mapping tool.

DPI developed and signed data-sharing agreements with both school districts and ISPs to securely share addresses to check for serviceability. This address checking service provides districts with detailed information from ISPs in their area at a granular address level. Once districts are aware of which providers can serve each address, they can compare vendors, pricing, and plans, and make bulk purchasing decisions using the Digital Learning Bridge.

50 CESA Purchasing. (2022). *Digital Learning Bridge*. Retrieved March 22, 2022, from <https://cesapurchasing.org/digital>.

51 Wisconsin Department of Public Instruction. (n.d.). *Funding Quick Reference Guide*. Retrieved March 22, 2022, from <https://dpi.wi.gov/broadband/funding-quick-reference-guide>.



Supporting LEA Use of Digital Equity Data

DPI continues to support schools with analyzing digital equity data as part of a continuous school improvement planning process to help meet student needs for continuity of high-quality learning where they live. DPI provides training and support for schools and libraries to access multiple funding sources that support their local broadband and device access goals. In 2022, DPI co-led a webinar with the PSC on the FCC's change from the Emergency Broadband Benefit program to the Affordable Connectivity Program (ACP). DPI shared information about how schools and libraries can work with other community partners and nonprofits to host registration events. DPI also highlighted how a school district and local library hosted several registration events in partnership to assist community members with enrolling in the ACP.

Challenges & Lessons Learned

Closing the digital equity gap is a priority to ensure high-quality learning for all children in Wisconsin through access to robust broadband and digital learning resources, especially in rural areas and other groups lacking internet access. DPI continues to partner with other agencies and community partners and be deeply engaged in addressing the persistent digital equity gaps faced by Wisconsin's students along with the rest of Wisconsin's citizens. Collecting data about access and affordability of both devices and adequate internet bandwidth has allowed DPI to develop data-driven systems-level solutions that facilitate both immediate and long-term actions to help individuals and families.

Appendix A:

Additional Resources

The following is a sample list of resources developed by federal, state, and local agencies, as well as organizations, related to digital equity.

Federal Resources

Affordable Connectivity Program (ACP)

<https://www.fcc.gov/affordable-connectivity-program>

In November 2021, Congress created this new long-term \$14 billion Federal Communications Commission (FCC) program, which will replace the Emergency Broadband Benefit Program. This investment in broadband affordability will help ensure people can afford the connections they need for work, school, health care, and more for a long time.

BroadbandUSA

<https://broadbandusa.ntia.doc.gov/>

The National Telecommunications and Information Administration's BroadbandUSA program serves state, local, and tribal governments, industry, and nonprofits that seek to expand broadband connectivity and promote digital inclusion.

Building Technology Infrastructure for Learning

<https://tech.ed.gov/infrastructure/>

This guide provides practical, actionable information intended to help district leaders navigate the many decisions required to deliver internet connectivity to students.

Children's Internet Protection Act (CIPA)


<https://www.fcc.gov/consumers/guides/childrens-internet-protection-act>

CIPA was enacted by Congress in 2000 to address concerns about children's access to obscene or harmful content over the Internet. CIPA imposes certain requirements on schools or libraries that receive discounts for internet access or internal connections through the E-Rate program, a program that makes certain communications services and products more affordable for eligible schools and libraries.

Common Education Data Standards (CEDS)

<https://ceds.ed.gov/>

CEDS is an education data management initiative whose purpose is to streamline the understanding of data within and across early learning, elementary, secondary, postsecondary,



and workforce (P-20W) institutions and sectors. The CEDS initiative includes a common vocabulary, data models that reflect that vocabulary, tools to help education stakeholders understand and use education data, an assembly of metadata from other education data initiatives, and a community of education stakeholders who discuss the uses of CEDS and the development of the standard.

The Condition of Education

<https://nces.ed.gov/programs/coe>

This report contains key indicators that summarize important developments and trends on all levels of education, labor force outcomes, and international comparisons. It includes indicators on Children’s Internet Access at Home and the Impact of the Coronavirus Pandemic on the Elementary and Secondary Education System.

ConnectHome

<https://www.hud.gov/connecthomeusa>

The U.S. Department of Housing and Urban Development launched this program to address the “homework gap” for students in grades K-12 living in public and Indian housing by offering broadband access, technical training, digital literacy programs, and devices for residents in assisted housing units.

Coronavirus Aid, Relief, and Economic Security Act (CARES Act)

<https://oese.ed.gov/offices/education-stabilization-fund/>

The U.S. Department of Education (ED) created four grant programs that can be spent on hardware and software, connectivity, and instructional expertise to support remote learning, among other activities.

The Elementary and Secondary Education Act (ESEA), as amended by the Every Student Succeeds Act (ESSA), and the Individuals with Disabilities Education Act (IDEA)

<https://tech.ed.gov/files/2017/01/2017.1.18-Tech-Federal-Funds-Final-V4.pdf>

This letter provides examples of how funds may support the use of technology to improve instruction and student outcomes.

Emergency Connectivity Fund (ECF)

<https://www.fcc.gov/emergency-connectivity-fund>

The FCC’s ECF is a \$7.17 billion program that aims to help schools and libraries provide the tools and services their communities need for remote learning during the coronavirus disease (COVID-19) pandemic.

Federal Funding

<https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding>

The BroadbandUSA website contains a searchable database of various funding opportunities that support broadband planning, digital inclusion, and deployment projects.

Home Access Playbook: Strategies for State Leaders Working to Bridge the Digital Divide for Students

<https://tech.ed.gov/home-access-playbook/>

This playbook outlines seven strategies that state leaders are taking to address the need for home internet and device access for students.

How Can Districts Support Families' Access to Technology During School Closures?

https://ies.ed.gov/ncee/edlabs/regions/northeast/Docs/Blog/FAQ_COVID19_TechnologyAccess_508c.pdf

This Regional Educational Laboratory (REL)–Northeast & Islands Frequently Asked Questions document offers links to examples and resources focused on how schools and districts can find creative ways to support students and families with limited access to technology.

Infographics Shed Light on Rural Internet Connectivity Issues

<https://ies.ed.gov/ncee/edlabs/regions/central/blog/rural-connectivity-infographics.asp>

REL–Central worked with six of the states in its region to examine where students are more likely to lack reliable home internet access. This work revealed considerable access gaps and disparities across places.

Keeping Students Connected and Learning: Strategies for Deploying School District Wireless Networks as a Sustainable Solution to Connect Students at Home

<https://tech.ed.gov/wireless-brief/>

This brief presents strategies for deploying off-campus wireless networks as a sustainable solution to provide home connectivity to all students and educators.

Learning Remotely in the Age of COVID-19: Lessons from Evidence and Concerns for Equity

https://ies.ed.gov/ncee/edlabs/regions/midatlantic/app/Docs/Events/Remote_Learning_Webinar_Slides_508.pdf

This REL–Mid-Atlantic webinar disseminated information about evidence-based practices and approaches in supporting effective remote learning, shared a high-level framework to help inform decision-making by states, districts, and schools in responding to remote learning, and highlighted approaches to addressing equity concerns that arise from school closures.

Lifeline

<https://www.fcc.gov/general/lifeline-program-low-income-consumers>

The FCC Lifeline program provides subscribers a discount on qualifying monthly telephone, broadband, or bundled voice-broadband packages to help ensure that low-income consumers can afford 21st-century broadband and the access it provides to jobs, healthcare, and educational resources.

Monthly School Survey Dashboard

<https://ies.ed.gov/schoolsurvey/>

This dashboard provides insights into learning opportunities offered by schools during the COVID-19 pandemic, including the percentage of schools that reported prioritizing students without internet access at home for in-person instruction.



National Assessment of Educational Progress (NAEP) Technology & Engineering Literacy (TEL) Report Card

<https://www.nationsreportcard.gov/tel/>

The NAEP TEL assessment at grade 8 measures three interconnected areas of technology and engineering literacy. Results are based on a representative sample of students in both public schools and nonpublic schools and are reported for students overall and for selected demographic groups.

The National Center for Education Statistics (NCES) Ed Tech Equity Initiative

<https://nces.ed.gov/resources/edtechequity/>

This initiative aims to better inform the condition of American education by giving greater attention to education technology and equity (ed tech equity) as it relates to K-12 education.

National Education Technology Plan

<https://tech.ed.gov/netp/>

This flagship educational technology policy document for the United States articulates a vision of equity, active use, and collaborative leadership to make everywhere, all-the-time learning possible.

Protecting Student Privacy

<https://studentprivacy.ed.gov/>

ED's Student Privacy Policy Office (SPPO) is responsible for the administration and enforcement of federal laws relating to the privacy of students' education records, and for the provision of technical assistance on student privacy issues for the broader education community.

Statewide Longitudinal Data System (SLDS) Grant Program Webinar: COVID-19 and Equity - How the Pandemic has Revealed and Exacerbated Inequities and How States are Addressing them

<https://slds.ed.gov/#communities/pdc/documents/2021>

This webinar addresses, in part, how the Wisconsin Department of Public Instruction is working to eliminate the digital equity gap in collaboration with agency partners to ensure that every Wisconsin K-12 student will have broadband internet connections for learning purposes.

Strategies to Support Remote Learning Along a Continuum of Internet Access

<https://ies.ed.gov/ncee/edlabs/regions/central/events/remote-learning-support.asp>

This REL–Central Quick Chat discusses strategies school districts can use to bridge the digital divide and support student learning at home.

Student Access to Digital Learning Resources Outside of the Classroom

<https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2017098>

This report draws upon nationally representative data sources, existing research, and relevant state and local intervention efforts to provide a comprehensive picture of student access to digital learning resources outside of the classroom.

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>

This blog post continues a robust discussion about data collected from the 2019 National Assessment of Educational Progress (NAEP) and Household Pulse Survey (HPS) that illuminate the issue of students' access to the Internet and digital devices at home.

Universal Service Program for Schools and Libraries (E-Rate)

<https://www.usac.org/e-rate/>

The FCC E-Rate program provides discounts for telecommunications, internet access, and internal connections to eligible schools and libraries.

State and Local Resources

Anchorage School District (AK) Digital Equity Survey

<https://www.asdk12.org/cms/lib/AK02207157/Centricity/Domain/1180/ENGLISH-ASD%20Digital%20Equity%20Survey.pdf>

This survey collected data on student internet and technology access to students at home.

Broadband for Unserved Students - Update

<http://www.marylandpublicschools.org/stateboard/Documents/2021/0323/BroadbandAccessEfforts.pdf>

The Maryland Governor's Office of Rural Broadband developed this plan to support expanded broadband access for education.

California Emerging Technology Fund (CETF)

<https://www.cetfund.org/>

CETF provides leadership statewide to close the "Digital Divide" by accelerating the deployment and adoption of broadband to unserved and underserved communities and populations.

Community Broadband Planning Playbook

<https://www.ncbroadband.gov/technical-assistance/playbook>

This playbook provides the tools needed to follow the North Carolina Department of Information Technology Technical Assistance team's guidance to help expand broadband access in North Carolina communities. It uses functional resources to help identify current broadband needs; take stock of available assets, strengths, and weaknesses; establish goals; and create and implement policies that will help communities achieve their vision for the future.

Connecting Kids

<https://connectingkidsnv.org/>

The Nevada COVID-19 Task Force developed a public-private initiative to help ensure internet connectivity for all students.

Digital Equity in Cambridge: Data and Strategic Recommendations

<https://www.cambridgema.gov/-/media/Files/citymanagersoffice/cityofcambridgedigitalequitystudymarch2021.pdf>

This study was commissioned to develop a complete, clear understanding of the problems preventing residents from obtaining and effectively using broadband, and to suggest solutions



for the City of Cambridge, Massachusetts to consider related to broadband access, affordability, device ownership, and digital skills.

Future Ready Nebraska District Technology Profile

<https://nep.education.ne.gov/statedata.html#00-0000-000/districttech/20192020>

This website reports digital learning, access, and equity data that are reported by Nebraska local education agencies (LEAs).

Hamilton County - Broadband Survey

https://www.surveymonkey.com/r/Preview/?sm=vpu8_2BpkmRHJ2RDlm_2B_2FCaoQ4KsNmMboImUnH2ZHAEMdJZWeOPRRxlXgWuSmZCrSuG

Indiana's Hamilton County Broadband Task Force conducted this survey to identify areas where broadband connections could be improved.

Indiana School Tech Plan

<https://www.in.gov/doe/it/indiana-school-tech-plan/>

This plan provides an annual snapshot of where corporations are concerning integrating student technology and the infrastructure to support it. The plan was updated in 2021 to better understand the landscape of K-12 digital learning and the technical and instructional responsiveness of schools through the COVID-19 pandemic.

Kentucky Digital Readiness Survey

https://applications.education.ky.gov/TRS_Reports/#::~text=Digital%20Readiness%20Reports%20The%20Kentucky%20Digital%20Readiness%20Survey,throughout%20Kentucky%20as%20of%20June%2030th%20each%20year

This website provides a snapshot of technology infrastructures throughout Kentucky schools and districts.

Learning Devices

<https://www.brandywineschools.org/domain/5080>

Starting in the school year 2020-21, Brandywine School District (DE) provided all K-12 students with a computing device that students are required to use daily for schoolwork completed both at school and home.

Nashville Digital Inclusion Needs Assessment Results Questionnaire

<https://data.nashville.gov/api/views/a5y8-6i89/files/97748194-73c6-489a-bb89-8606d16744e8?download=true&filename=Nashville-Digital-Inclusion-Needs-Assessment-Results-Questionnaire.pdf>

The Nashville (TN) Digital Inclusion and Access taskforce collected data with this questionnaire to assess just how broad the gap is between those who thrive in the digital world and those who are left out.

New York State Education Department (NYSED) Digital Equity Survey

<http://www.nysed.gov/memo/information-reporting-services/digital-equity-survey-data-collection-and-reporting-sirs>

In Spring 2020 and Fall 2020, NYSED required public schools to collect and report information on student access, in their places of residence, to devices and the Internet.

Noblesville Schools HelpDesk

<https://www.noblesvilleschools.org/Page/7055>

This page includes Noblesville Schools' (IN) technology resources, current district technology updates, top frequently asked questions (FAQs), and information on how to get additional technology support.

Putnam County Schools (WV) Technology Survey (Summer 21)

<https://forms.office.com/pages/responsepage.aspx?id=S7AZ4AwzekaLrgn7FzdNaoDBVZl1tbxHvRD-Zj373ytUQk000FNMTVc2NDI5Wks1N1RVMUFCV1Y3WC4u>

This survey collected data to help this West Virginia district provide better internet and technology access to students.

Student Device Program

<https://www.wcpss.net/site/default.aspx?PageType=3&DomainID=153&ModuleInstanceID=2805&ViewID=6446EE88-D30C-497E-9316-3F8874B3E108&RenderLoc=0&FlexDataID=233422&PageID=358>

Wake County Public School System (NC) assigned each K-12 student a laptop at the beginning of the 2021-22 school year for students to use in school and at home (with parental permission). Students have the option to bring a personal device to school instead, provided the personal device meets certain requirements and has been approved by the district.

School2Home

<https://school2home.org>

Since 2009, School2Home has provided financial support and technical assistance to partner schools in 12 districts throughout California. School2Home is a comprehensive initiative that builds the capacity of its partner schools to integrate technology into teaching, learning and parent engagement to improve student outcomes and establish a sustainable digital learning culture.

Standards of Learning (SOL) for Digital Learning Integration

<https://www.doe.virginia.gov/support/technology/standards/index.shtml>

The Virginia SOL for Digital Learning Integration describe a progressive development of knowledge and skills necessary to access, evaluate, use, and create information using technology. The focus is on learning to use technology effectively and wisely rather than learning about technology.

West Virginia College- and Career-Readiness Standards for Technology and Computer Science

<https://apps.sos.wv.gov/adlaw/csr/readfile.aspx?DocId=50990&Format=PDF>

These content standards for technology and computer science are intended to provide a focus for teachers to teach and students to learn those skills and competencies essential for future success in the workplace and to further education.

West Virginia Kids Connect

<https://wvkidsconnect.net/>

This initiative installed the necessary equipment to turn all public schools, higher education institutions, county libraries, and state parks into Wi-Fi hotspots to support the learning needs of children who do not have access to the Internet in their homes.

Wisconsin Standards for Information and Technology Literacy

<https://dpi.wi.gov/imt/it-literacy-standards>

These standards are intended to provide an important foundation to prepare students to be college- and career-ready.

Other Resources

Digital and Media Literacy

<https://www.iste.org/explore/category/digital-and-media-literacy>

The International Society for Technology in Education (ISTE) has compiled resources on how to help students build foundational technology literacy skills.

Digital Equity

<https://www.cosn.org/tools-resources/toolkits/digital-equity/>

The Consortium for School Networking (CoSN) has updated its Digital Equity Toolkit. The new version spotlights ways in which schools and districts have successfully addressed digital equity challenges and identifies community engagement opportunities around digital access and inclusion.

Digital Equity Audit: Self-Assessment Tool

<https://practices.learningaccelerator.org/artifacts/digital-equity-audit-self-assessment-tool>

This Self-Assessment Tool is intended to foster productive dialogue within leadership teams in an iterative manner. The tool has been created to support teams when using The Learning Accelerator's Digital Equity Guide.

Digital Equity Guide

<https://practices.learningaccelerator.org/guides/digital-equity/introduction>

The Learning Accelerator created this guide to support concrete, actionable conversations among school and district leaders that lead to coherent plans to address the nuance and complexity of digital equity.

Digital Equity Initiative

<https://www.cosn.org/digitalequity>

CoSN has several resources on closing the access gap for learning no matter where the students are, including a report on student home internet connectivity and a digital equity toolkit.

Ed-Fi Working Draft 3: Digital Equity Collection

<https://techdocs.ed-fi.org/display/EFDS/DRAFT/ED-FI+WORKING+DRAFT+3+-+DIGITAL+EQUITY+COLLECTION>

The Ed-Fi Alliance worked with several states to set up application programming interface (API) endpoints for collecting CEDS-aligned student-level digital access data elements via the student information system.

EducationSuperHighway

<https://www.educationsuperhighway.org/resources/>

Since 2012, this nonprofit has provided free support to help school districts upgrade internet access in every public school classroom in America. It is now focused on providing states and school districts with the tools they need to connect the estimated 10-15 million students who lack home broadband.

Equity of Access

<https://www.setda.org/priorities/equity-of-access/>

The State Educational Technology Directors Association (SETDA) has published reports and compiled resources on national and state digital equity programs, broadband and Wi-Fi access, E-Rate, and federal policies and funding.

Home Digital Access Data Collection: Blueprint for State Education Leaders

<https://learning.ccsso.org/restart-recovery-home-digital-access-data-collection-blueprint-for-state-education-leaders>

The Council of Chief State School Officers (CCSSO) developed a blueprint for how state leaders can facilitate the collection of high-quality data to identify which students are adversely impacted by the home digital access gap.

Plan a Successful 1:1 Technology Initiative

<https://www.iste.org/explore/ISTE-blog/Plan-a-successful-1%3A1-technology-initiative>

This blog post reviews the importance of 1:1 planning, explains how ISTE standards can help educators with planning, and shares lessons learned from districts.

What Remote Learning Revealed About the Benefits of 1:1 Devices

<https://www.iste.org/explore/learning-during-covid-19/what-remote-learning-revealed-about-benefits-11-devices>

This ISTE blog post discusses the results of a survey of Michigan K-12 teachers that provide some insight into the potential positive impact for teaching and learning when students had access to a school-provided device before and during the COVID-19 pandemic.

Appendix B:

Sample Digital Equity Questions

Many questions could be asked to fully understand the current state of digital equity. The following list of questions can assist state and local education agencies (SEAs and LEAs) as they seek to understand student access to devices, the Internet, and technology support. SEAs and LEAs that are planning to gather similar types of information on digital equity may find it useful to consider these questions. This list is not exhaustive or prescriptive, and agencies should modify the questions in this appendix to best meet their information needs.

Device Access at Home

- What device does your student most often use to complete schoolwork and learning activities away from school?
- Is this device shared with anyone else in the household?
- Is this device a personal device or did the school issue your student a dedicated district- or school-provided device for their use during the school year?
- Is this device sufficient for your student to fully participate in all learning activities away from school?

Internet Access at Home

- Can your student access the Internet on this device at home?
- What is the primary type of internet service used at home?
- Can your student complete the full range of learning activities at home, including streaming videos and uploading assignments, without interruptions caused by slow or poor internet performance?
- What, if any, is the primary barrier to having sufficient and reliable internet access in your student's home?

Technology Support

- If your student needed assistance with digital learning activities at home, does your family feel you know enough about computers and technology to be able to help your student, or would you need someone to help them?
- What kind of technical support would your family be most likely to use if your student needed assistance with digital learning activities at home?

Appendix C: Digital Equity Audit Resources

Education agencies that are interested in conducting a digital equity audit may find the following resources beneficial to consult.

- The Consortium for School Network (CoSN) Digital Equity Toolkit: Supporting Students & Families in Out-of-School Learning: <https://www.cosn.org/tools-resources/toolkits/digital-equity/>
- The Learning Accelerator Digital Equity Audit: Self-Assessment Tool: <https://practices.learningaccelerator.org/artifacts/digital-equity-audit-self-assessment-tool>

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National Forum on Education Statistics Resources

Forum Guide to Virtual Education Data: A Resource for Education Agencies (2021)

https://nces.ed.gov/forum/pub_2021078.asp

This resource is designed to assist agencies with collecting data in virtual education settings, incorporating the data into governance processes and policies, and using the data to improve virtual education offerings. This resource reflects lessons learned by the education data community during the coronavirus disease (COVID-19) pandemic and provides recommendations that will help agencies collect and use virtual education data.

Forum Guide to Attendance, Participation, and Engagement Data in Virtual and Hybrid Learning Models (2021)

https://nces.ed.gov/forum/pub_2021058.asp

This resource provides an overview of best practices that will help education agencies collect, report, and use attendance, participation, and engagement data in different learning formats. It was developed as a companion publication to the 2018 *Forum Guide to Collecting and Using Attendance Data* and incorporates lessons learned by state and local education agencies (SEAs and LEAs) during the COVID-19 pandemic.

Forum Guide to Cybersecurity: Safeguarding Your Data (2020)

https://nces.ed.gov/forum/pub_2020137.asp

This resource provides timely and useful best practice information to help education agencies proactively prepare for, appropriately mitigate, and responsibly recover from a cybersecurity incident. It provides recommendations to help protect agency systems and data before, during, and after a cybersecurity incident and features case studies from SEAs and LEAs.

Forum Guide to Data Governance (2020)

https://nces.ed.gov/forum/pub_2020083.asp

This resource provides timely and useful best practices, examples, and resources for agencies implementing or updating their data governance programs. It provides an overview of data governance; discusses effective data governance practices, structures, and essential elements; describes how to meet privacy and security requirements while also meeting data accessibility and sharing needs; and includes detailed case studies from education agencies in their data governance efforts.

Forum Guide to Technology Management in Education (2019)


https://nces.ed.gov/forum/tech_management.asp

This resource is designed to assist education agency staff with understanding and applying best practices for selecting and implementing technology to support teaching and learning in the classroom. It addresses the widespread use and integration of technology in modern education systems and focuses on technology governance and planning, technology implementation, integration, maintenance, support, training, privacy, security, and evaluation.

Forum Guide to Reporting Civil Rights Data (2018)

https://nces.ed.gov/forum/pub_2017168.asp

This resource presents a variety of effective methods through which LEAs report civil rights data to the U.S. Department of Education's Office for Civil Rights. In addition, the guide provides examples of how SEAs can voluntarily help their LEAs with Civil Rights Data Collection (CRDC)



reporting. The guide includes an overview of the CRDC, a discussion of the challenges and opportunities in reporting civil rights data, an explanation of the CRDC reporting process, and six case studies that examine how specific education agencies report civil rights data.

Forum Guide to Education Data Privacy (2016)

https://nces.ed.gov/forum/pub_2016096.asp

This resource provides SEAs and LEAs with best practice information to use in assisting school staff in protecting the confidentiality of student data in instructional and administrative practices. SEAs and LEAs may also find the guide useful in developing privacy programs and related professional development programs.

Forum Guide to Taking Action with Education Data (2013)

https://nces.ed.gov/forum/pub_2013801.asp

This resource provides practical information about the knowledge, skills, and abilities needed to identify, access, interpret, and use data to improve instruction in classrooms and the operation of SEAs, LEAs, and schools.

Forum Guide to Ensuring Equal Access to Education Websites: Introduction to Electronic Information Accessibility Standards (2011)

https://nces.ed.gov/forum/pub_2011807.asp

This resource is intended to raise awareness in nontechnical audiences and suggest best practices for complying with Section 508 goals at an operational level in SEAs, school districts, and schools. It is not intended to recreate technical resources that already exist to facilitate Section 508 compliance.

Forum Curriculum for Improving Education Data: A Resource for Local Education Agencies (2007)

https://nces.ed.gov/forum/pub_2007808.asp

This curriculum supports efforts to improve the quality of education data by serving as training materials for K-12 district and school staff. It provides lesson plans, instructional handouts, and related resources, and presents concepts necessary to help schools develop a culture for improving data quality.

Forum Guide to Building a Culture of Quality Data: A School & District Resource (2005)

https://nces.ed.gov/forum/pub_2005801.asp

This resource was developed to help school districts and schools improve the quality of data they collect and to provide processes for developing a “Culture of Quality Data” by focusing on data entry—getting things right at the source. This resource shows how quality data can be achieved in a district or school through the collaborative efforts of all staff.