HANOVER RESEARCH

BEST PRACTICES IN ADDRESSING DIGITAL DIVIDES

In the following report, Hanover Research presents the results of an analysis of best practices and approaches to online delivery that can help bridge digital divides.

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OVERVIEW OF DIGITAL DIVIDES

INTRODUCTION

Across North America, uneven access to computers and the internet presents a difficult hurdle to higher education providers in delivering online programs equitably.

In 2017, the most recent year for which these data are available, the United States Federal Communication Commission (FCC) estimated that more than 21 million people were unable to access broadband internet. Most observers consider that a conservative figure and assert a much broader digital divide. For example, a study published by Microsoft in 2019 asserts that nearly 163 million Americans do not use broadband internet for reasons ranging from inability to access providers to cost. A similar problem exists in Canada, where median rural download speeds are 3.7 Mbps, in contrast to the 44.09 Mbps median speed in urban areas.

In addition to issues of infrastructure and access, the digital divide also presents itself as a skills gap between those who are frequent users of computers and the internet and those who are not.

With online learning moving from choice to necessity in 2020, higher education institutions are called on to take pro-active and highly flexible approaches to addressing the digital divide within their student populations. While leading with ideas for bridging this gap, institutions must also maintain consistent contact with their key stakeholder groups to understand evolving needs and effective support systems.

DIGITAL DIVIDE RISK FACTORS

Researchers identify five primary factors that impact the digital divide: age, income and educational attainment, community type, disability, and Spanish-speaking preference.

PRIMARY FACTORS CONTRIBUTING TO A DIGITAL DIVIDE IN THE U.S.

Age	▪ 44 percent of individuals over age 65 do not use the Internet
Income and Educational Attainment	▪ 41 percent of individuals without a high school degree are offline ▪ 24 percent of individuals with a household income of less than $30,000 do not use the Internet
Community Type	▪ 20 percent of rural residents are offline
Disability	▪ 46 percent of individuals with a disability do not use the Internet
Spanish-Speaking Preference	▪ 29 percent of individuals with a Spanish-speaking preference are offline ▪ Overall, 24 percent of Hispanics do not use the Internet

Source: Pew Research Center

BEST PRACTICES IN ONLINE DELIVERY: INFRASTRUCTURE

ACCESS TO TECHNOLOGY

Access to technology remains a prominent issue in higher education.
Many college students have inadequate access to technology. A 2018 study found that most college students own devices such as laptops and smartphones. Still, approximately 20 percent of students have "difficulty maintaining access to technology" due to issues including broken hardware, data limits, and connectivity problems. In particular, low-income and minority students are more likely to use older devices that are prone to breaking down and are less likely than their affluent counterparts to ask their instructors for help or extended deadlines

Loaning equipment has been a common strategy for resolving issues of access to technology in the past.
For example, many institutions previously allowed for short-term equipment lending, often facilitated by the campus library. A 2019 study of US community college students found that 42 percent of students thought access to loaned technology (for academic and personal use) would be "extremely valuable." The majority of students preferred to borrow technology for at least a semester at a time and the service was valuable both to on-campus and online students. The most popular technologies for loan included wifi hotspots (80%), printers (74%), laptops (71%) and multimedia editing computers and software (60%). **In response to the transition to online learning brought on by the COVID-19 pandemic, many institutions are instituting broader programs to help students access technology.**

81%
Percentage of institutions loaning laptops or other devices

47%
Percentage of institutions loaning Wi-Fi hotspots

28%
Percentage of institutions working to give students free or low-cost equipment

Source: *Educause*

CASE STUDY: LOS ANGELES PIERCE COLLEGE

Using a Title V grant, Los Angeles Pierce College (Pierce) purchased 50 laptops to loan to low-income students enrolled in online courses.
The Student Loaner Laptop program targets students enrolled in a distance education course that the Extended Opportunity Programs and Services (EOP&S) office identifies as "having financial need to help them get access to their online course." Through the program, Pierce has been able to "increase the number of low-income students [it] can serve in the online format." The program works to fulfill Pierce's distributive/distance education vision, which includes the following goals:

- To offer students an opportunity to access their materials and coursework through integrated technology anywhere and anytime
- Using alternative delivery methods, allow students an opportunity to take college courses
- To build online communities where students are engaged and cultivate knowledge from collaborative learning environments
- Develop distance education programs in which the standards and practices of on-site courses are reflected

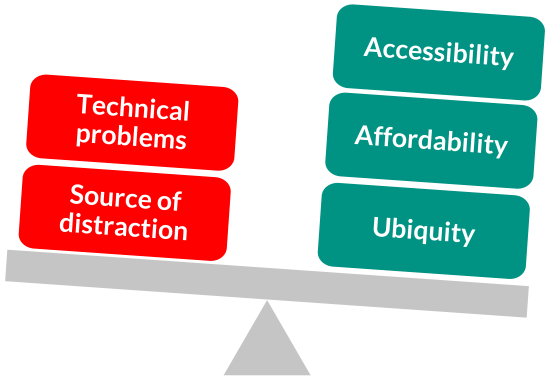
Source: Pierce

Pierce's online division also has laptops to loan to faculty members teaching online courses.
Each of the 10 laptops comes equipped with "specific programs that encourage [the] creation of interactive and engaging online learning experiences." One such program is SoftChalk, which is an e-learning authoring tool. Pierce notes that the course content created on these laptops "encourages student engagement [through] interactive lessons and learning activities."

BEST PRACTICES IN ONLINE DELIVERY: INFRASTRUCTURE

MOBILE LEARNING

Mobile learning is one method that can help institutions to bridge the digital divide.
Educause defines mobile learning as "using portable computing devices (such as iPads, laptops, tablet PCs, PDAs, and smartphones) with wireless networks [to enable] mobility[,] allowing teaching and learning to extend to spaces beyond the traditional classroom." Mobile learning is particularly beneficial to at-risk students, as approximately 56 percent of underserved students with only one device only have a smartphone to access the Internet. Although mobile learning has its drawbacks, experts tend to agree that the advantages outweigh the disadvantages.



Source: IEEE

A majority of online students use or want to use mobile devices to access the virtual classroom.
A 2018 study found that 67 percent of online students used a smartphone or tablet to complete course-related activities, and an additional 12 percent would have like to use a mobile device. Top activities completed using a smartphone or tablet include reading required materials (51 percent), communicating with professors (51 percent), and accessing the learning management system (45 percent), indicating that students are interested in completing text-based activities on a mobile device.

CASE STUDY: WALTERS STATE COMMUNITY COLLEGE

Walters State Community College (Walters State) was among the first community colleges in the United States to launch a mobile learning initiative.
The institution launched its mobile learning initiative in 2012 upon realizing "the engagement [it] saw in students with their mobile devices." Resources available to students and faculty through the effort include iPads, mobile document cameras, wireless access points, and Wi-Fi hotspots. The initiative has achieved a 90 percent voluntary faculty participation rate, and Walters State has witnessed increased student learning outcomes ranging from 10 to 25 percent. Walters States' mobile learning efforts have earned it designation as an Apple Distinguished School, which recognizes institutions that have "a clear vision for how their technology-rich environments support learning goals."

"Mobile devices such as smartphones and tablets have revolutionized how we communicate and access information. So why not use them as an educational tool? That's the question Walters State asked a couple of years ago. Today, we are at the forefront of mobile learning. Walters State was one of the first community colleges in the country to implement a mobilization plan to engage students from admission through graduation. Each academic division has developed a plan to integrate mobile learning devices into classroom instruction. Faculty members are using over 60 different apps in nearly every subject to engage students. And we make iPads accessible to students through iPad carts used in classrooms and iPads that can be checked out in the library. This dynamic approach to learning not only enhances our students' educational experience but increases their chances of completing a degree."

Source: Walters State

BEST PRACTICES IN ONLINE DELIVERY: PROGRAM DESIGN

LOW-TECH STRATEGIES

To accommodate students (or faculty) without consistent access to technology or comprehensive digital skills, some institutions are exploring or have adopted low-technology strategies to deliver course content and assessment. Low-tech options also encourage equity across all student demographics.

One professor from the University of Ottawa warns that offering two different types of assignments (one for digitally connected students and one for less connected students) perpetuates the inequalities of the digital divide within classrooms. Less connected students may miss out on peer learning through online discussion groups or real-time question and answer sessions related to synchronous lectures.

Instead, institutions can implement low-tech instructional and support strategies that are more accessible *and* inclusive, such as mobile technology, email, and telephone.

TAP INTO CELL SIGNALS

Typically, cellular service is more widespread than high-bandwidth internet. Institutions can assist students by loaning mobile hotspots or distributing tablets that run directly off cell signals.

CREATE DEVICE-AGNOSTIC ASSIGNMENTS

In spring 2020, the College Board expanded access to traditionally in-person AP exams to allow students to complete the exam at home on a computer, tablet, or mobile phone. Students could also write the exam responses by hand and then take a photo of the paper to submit. Other professors recommend creating assignments and projects that are not based on online resources; instead, focusing on short essays, analysis of texts, or case study responses.

OPTIMIZE FOR MOBILE LEARNING

Professors can design course content for use on mobile devices and institutions can make mobile learning more accessible by loaning external keyboards to students for use with smartphones or tablets. Some optimizations could include:

- Using text messaging for reminders, office hours, assignments, or questions
- Providing cloud-based storage for students with devices with less space
- Designing course content for viewing on small screens (such as publishing on mobile-friendly webpages linked to the online syllabus)

LOW-TECH INSTRUCTIONAL ALTERNATIVES

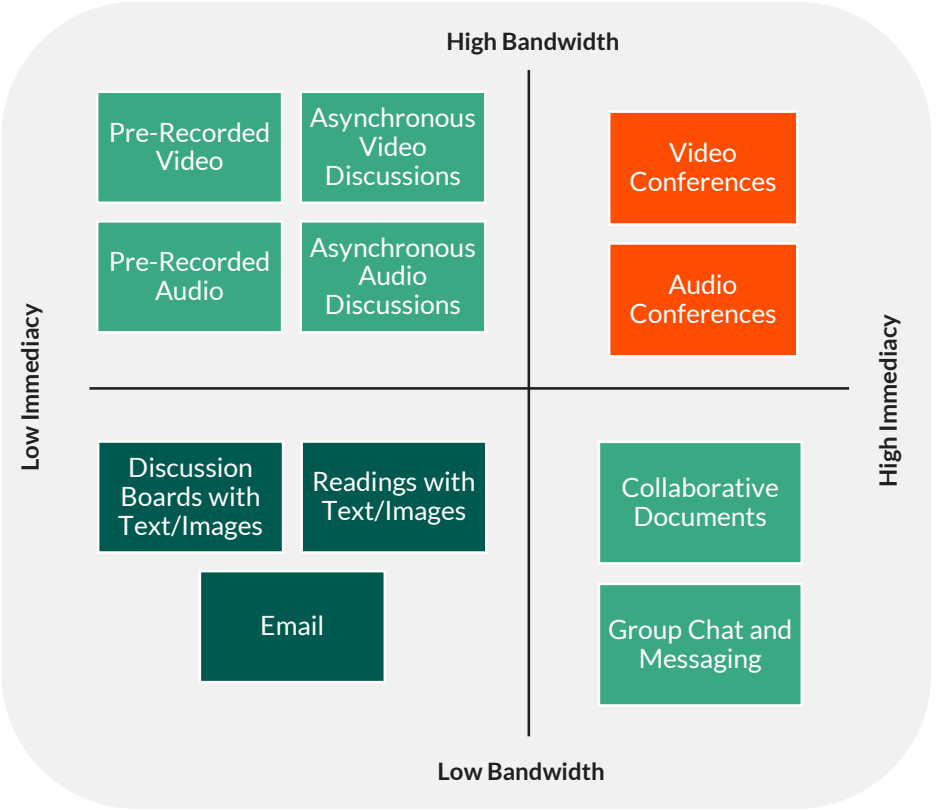
Instructors can make adjustments to online learning resources, class assignments, and online platforms to make course content more accessible to students with low bandwidth, minimal device access, or inconsistent access to internet connection. The University of North Carolina – Charlotte published a detailed list of strategies for asynchronous learning that are designed to accommodate all students. While many students may struggle to find high-speed internet access, many have access to cell data and mobile networks.

The following suggestions offer greater access.

LOW BANDWIDTH ALTERNATIVES

- Use low-resolution graphics or videos
- Use Google Meetup and Google Hangouts instead of high-bandwidth Zoom for peer tutoring
- Allow students to call into Webex or Google meetings with their phones
- Utilize text messaging for reminders
- Use Google shared folders and docs
- Create and record lectures in PowerPoint and save as mp4
- Create short low-resolution videos that can be uploaded and downloaded quickly
- Save videos to Youtube (which also auto-captions videos for a "good enough" option)

Daniel Stanford, the Director of Faculty Development and Technology at DePaul University, identifies two intersecting factors that must be considered when approaching accessible online education: ***bandwidth*** and ***immediacy***. While immediacy (asking questions; participating in discussions) is natural in a physical classroom setting, requiring immediacy in an online classroom can exclude students who do not have high-bandwidth technologies to accommodate video streaming. Stanford recommends shifting instructional reliance on immediacy to increase accessibility. The figure below displays technologies appropriate for each intersection of student and instructor needs.



BEST PRACTICES IN ONLINE DELIVERY: DIGITAL SKILLS

DIGITAL SKILLS INSTRUCTION

Institutions should ensure that students have adequate digital skills before allowing them to enroll in online courses.
Scholars identify five categories of digital skills required to help bridge the digital divide in higher education: technological literacy, informational literacy, media literacy, digital presence, and e-Awareness. Digital skills instruction is particularly vital for non-traditional learners, who may be new to studying in an academic environment using technology.

CATEGORIES OF DIGITAL SKILLS

Technological Literacy	Skills needed to use hardware and software
Informational Literacy	Skills needed to deal with information
Media Literacy	Skills needed to interact with different media
Digital Presence	Skills needed to monitor and establish a digital identity
e-Awareness	Skills needed to become aware of how the world varies because of digital technologies

Source: RUSC

CASE STUDY: CALIFORNIA COMMUNITY COLLEGES

In 2016, the California Community Colleges Chancellor's Office (CCCCO) developed Online Student Readiness Tutorials as part of its system-wide Online Education Initiative (OEI).
The OEI is an effort "to ensure that significantly more students are able to complete their educational goals by increasing both access to and success in high-quality online courses." Current interactive tutorials include:

- **Introduction to Online Learning** *12 minutes*
- **Getting Tech Ready** *12 minutes*
- **Organizing for Online Success** *12 minutes*
- **Online Study Skills and Managing Time** *12 minutes*
- **Communication Skills for Online Learning** *13 minutes*
- **Online Reading Strategies** *9 minutes*
- **Career Planning** *5 minutes*
- **Educational Planning** *8 minutes*
- **Instructional Support** *5 minutes*
- **Personal Support** *5 minutes*
- **Financial Planning** *5 minutes*

Source: CCCCO

BEST PRACTICES IN ONLINE DELIVERY: DIGITAL SKILLS

ONLINE ORIENTATION

Many institutions provide digital skills instruction through an online orientation to improve student retention in distance-based courses.
Online orientations "give students experiences that mimic online courses," enabling students to determine if the online environment is suitable for their learning styles. Experts argue that orientations for online students should:

- Be interactive
- Introduce students to the type of assignments that they will complete in their course
- Allow for the development of necessary technical and computer skills
- Introduce institutional policies, procedures, and resources
- Allow for the development of time management and study skills
- Allow for the development of appropriate online etiquette

Source: *Inquiry*

CASE STUDY: MIAMI DADE COLLEGE

Each term, Miami Dade College's online division (MDC Online) offers a free orientation that equips students with "technical skills necessary to succeed in an online course."
MDC Online strongly recommends that students complete the no-fee, non-credit online orientation, which is open to prospective, new, and current MDC students. MDC delivers its online orientation as a self-paced course through Blackboard's Open Education platform; Blackboard Learn is MDC's learning management system. The online orientation seeks to help students:

- Become successful online learners
- Gain learning and awareness through self-assessments
- Grow familiar with the Learning Management System
- Acquire the technical skills necessary to succeed in an online course
- Discover more about MDC's processes and academic resources

CASE STUDY: ALGONQUIN COLLEGE

Ontario's Algonquin College provides both asynchronous and synchronous resources as part of its Online Learning Orientation.
New students first watch eight orientation videos to familiarize themselves with tools and resources. The topics include:

1. ACSIS and Network Account Info
2. Brightspace
3. OntarioLearn
4. Success in Online Environments
5. Course Facilitators
6. Textbooks
7. Student Resources
8. Getting Started on Day #1

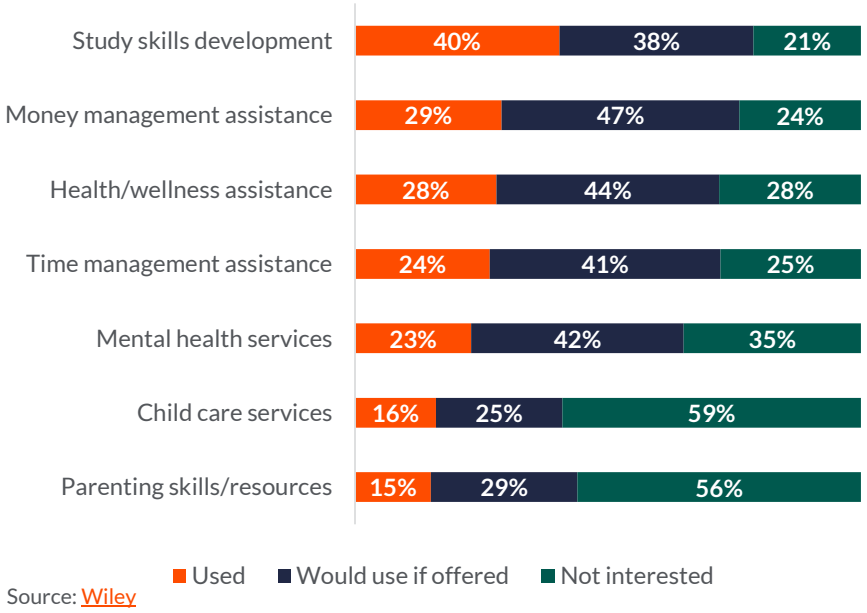
Once students complete the videos, they can register for a live Q&A session with an AC Online Student Success Specialist. The sessions are one hour in length and allow students to ask additional questions. Students who prefer additional assistance may schedule a 30-minute personalized individual appointment via phone or Zoom with a Student Success Specialist.

BEST PRACTICES IN ONLINE DELIVERY: SERVICES

ACADEMIC AND PERSONAL SUPPORTS

Institutions should offer online students the same academic and personal support services that are available to on-campus students.
Such supports "help online learners navigate through their academic experience and assist with various other personal needs," in turn improving student retention and graduation rates. Notably, first-generation students are significantly more likely than their peers to use all of the top academic and personal support services, except study skills development, revealing that such services could help to bridge economic divides.

TOP ACADEMIC AND PERSONAL SUPPORT SERVICES AMONG ONLINE STUDENTS



Source: Wiley

CASE STUDY: NORTHEAST COMMUNITY COLLEGE

Northeast Community College (Northeast) offers several virtual academic and personal support services for its online students.
The online support services seek to help students "succeed with [their] online studies and with [their] career[s] after college." Excluding Coursework for Success, which consists of placement and transitional coursework, all support services are available at no additional cost to students.

- Advising & Academic Support Center
- Academic Support
- Advisement
- Career Services
- Campus Bookstore
- Counseling
- Disability Services
- Library Resources
- Testing Center
- Coursework for Success

Source: Northeast

BEST PRACTICES IN ONLINE DELIVERY: SERVICES

ENGAGEMENT SUPPORTS

Engagement supports help to combat isolation among students in online courses.
A 2015 study reveals that "student engagement is a strong predictor of student persistence and degree completion" in online programs. Scholars identify three types of engagement supports: learner-to-content, learner-to-learner, and learner-to-instructor. Online engagement is particularly vital for non-traditional students, who may feel isolated from their younger classmates.

TYPES OF ENGAGEMENT SUPPORTS

Learner-to-Content Engagement Supports	Using technology to facilitate interaction between learners and course content *Example: Adaptive learning technology*
Learner-to-Learner Engagement Supports	Using digital platforms to promote interaction between learners *Example: Virtual student clubs, organizations, and affinity groups*
Learner-to-Instructor Engagement Supports	Using technology to increase instructor visibility *Example: Individual interactions with instructors*

Source: Urban

CASE STUDY: NORTHERN VIRGINIA COMMUNITY COLLEGE

Northern Virginia Community College (NOVA) offers "ELife" engagement opportunities for online students.
Opportunities available through ELife primarily focus on learner-to-learner engagement by connecting online students with one another. Notably, NOVA has a Virtual Student Union (VSU), which serves as "a digital hub for students to connect with the college and each other without having to physically be on campus." Engagement resources and events available through the VSU include:

- **Self-Paced Education Trainings on Diversity and Inclusion, Alcohol and Drug Abuse Prevention, and Leadership Skill Building**
- **Live-Stream Events and Webinars**
- **Monthly Book Club and Feature Film**
- **Contests on Social Media**
- **Conferences and Leadership Retreats**
- **Social Trips and Community Service Opportunities**

Source: NOVA

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