COLORADO
Department of
Labor and Employment

2021 Digital Literacy & Inclusion Report

Toward Digital Equity in Colorado

Office of the Future of Work
Colorado Department of Labor and Employment
June 2021

The 2021 Digital Literacy and Inclusion Report was published by the Colorado Department of Labor and Employment's (CDLE) Office of the Future of Work (OFOW); its vision is a future where all Coloradan workers have access to education and skill training that is connected to meaningful and sustainable employment. The OFOW was established through Executive Order B-2019-009 to raise awareness and identify policy and program solutions that prepare all Coloradans for the future of work.

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For questions or requests related to the 2021 Digital Literacy and Inclusion Report, please contact Katherine Keegan, Director of the OFOW, at katherine.keegan@state.co.us.

Introduction

As technological advances, including automation, artificial intelligence, and digitalization, continue to disrupt the way we work, it has become clear that if Coloradans are to remain competitive, they must build digital skills so they can work alongside technology, connect with quality jobs, and adapt as work evolves.

The COVID-19 pandemic has accelerated these disruptions, and has emphasized that if workers are to fully participate in work, learning, and daily life, they need access to reliable internet as well as training and educational opportunities.[1] The pandemic also showed us that the digital divide persists: as of March 2021, 64,878 households with children in the K-12 system had inconsistent access to the internet.[2][3]

Through targeted efforts to increase digital literacy and inclusion across the state, Colorado has the opportunity to level the playing field and ensure that all individuals and communities have the information technology skills and mindsets they need to adapt to the changing needs of the market. This report provides an overview of the current state of digital literacy and inclusion and outlines how to equip workers with the tools they need to fully participate in our society, democracy, and economy.

This 2021 Digital Literacy and Inclusion Report has four sections:

1. **Defining Digital Equity** provides definitions of the terms associated with digital equity and a framework to assess digital equity in the state.
2. **Digital Literacy Competencies for Daily Life, Learning, and the Future of Work** provides an overview of the Digital Skill Catalog which logs and categorizes 244 unique digital literacy competencies required for daily life, learning, and the future of work.
3. **Digital Equity Data and Gap** provides an overview of the data available to assess Colorado's digital equity.
4. **Colorado's Approach to Digital Equity and Next Steps** provides an overview of Colorado's approach to digital equity including efforts already underway and shares what's next for Digital Literacy and Inclusion in Colorado.

If you're interested in learning more about the impact of technology on work and other future of work trends, check out the Annual Report from the Office of Future of Work.

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[1] World Economic Forum (2019). The Future of Jobs Report 2020. Retrieved at http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

[2] Bathija, Priya. Digital Is the Next Frontier of Health Equity. American Hospital Association (2021). Retreived at https://www.aha.org/news/healthcareinnovation-thursday-blog/2021-04-07-digital-is-next-frontier-health-equity.

[3] U.S. Census Bureau (April 2021).Week 27 Household Pulse Survey: March 17- March 29. Retrieved at https://www.census.gov/data/tables/2021/demo/hhp/hhp27.html

1. Defining Digital Equity

Defining Digital Literacy, Resilience, Inclusion, and Equity

Colorado is working towards **digital equity**: a state in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. The three key components of digital equity include access to:

- Affordable, high-speed internet
- Affordable, web-enabled technology
- Relevant, high-quality, effective training and support for digital skill development and use

Digital inclusion refers to the activities necessary to ensure that all individuals and communities have access to information and communication technologies, and the literacy and resilience to use them.[4] *Digital inclusion activities lead to digital equity.*

Digital literacy refers to the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.[5]

Digital resilience is having the awareness, skills, agility, and confidence to use new technologies and adapt to changing digital skill demands.[6]

Framework to Measure Digital Equity

In July 2020, the OFOW partnered with the Colorado Center on Law and Policy (CCLP) to develop a Digital Equity Competency Framework that would inform policy recommendations and strategies to assess and address digital inequities in the state. **The framework provides reference points for key steps individuals and systems can take towards digital equity.**

This work began in 2020 with a review of existing digital literacy frameworks and core competencies from national entities and local service providers. Between September and December 2020, CCLP and OFOW built the Digital Equity Competency Framework based on this review, and with support and feedback from the Skills 2 Compete Coalition of service providers. The Framework can be found in its entirety online, and in a briefer form on the next page.

How to Read the Framework

The framework should be read from left to right (Figure 1). The leftmost column contains foundational competencies that acknowledge the existence of digital inequity and the need to address it. The competencies progress from Stages 1 through 3 with each reflecting digital inclusion activities that build on the previous competencies in each category. The rightmost column of the chart contains advanced competencies that reflect a state of digital equity.

Figure 1. Image showing how the Digital Equity Competency Framework is organized

[4] Adapted from National Digital Inclusion Alliance definition
[5] Adapted from National Digital Inclusion Alliance definition
[6] DigitalUS. Retrieved at https://digitalus.org/our-work/

Skillset	Level	Foundational Competencies (acknowledgement of digital inequity)	Stage 1 Competencies (digital inclusion activities)	Stage 2 Competencies (digital inclusion activities)	Stage 3 Competencies (digital inclusion activities)	Advanced Competencies (digital equity)
Digital skills for daily life	Individual					
	Systemic					

This framework includes the following key components that separate it from existing resources:

- *Four skillsets associated with digital equity*: Competencies are separated based on the component of digital equity they address, including digital skills for daily life, connectivity/infrastructure (access to high-speed internet), equipment (what technology people need to achieve their goals), and digital skills for education, training, and work.
- *Each skillset begins with foundational competencies that demonstrate self-efficacy*: Throughout the research process, CCLP and OFOW found that the first step towards digital equity was the need for individuals and systems to acknowledge how digital skills, technology, and internet are helpful and, in some cases, necessary in order to reach their goals. For this reason, each competency continuum begins with this acknowledgement.
- *A systems and individual approach*: While many competency frameworks focus solely on the need of an individual to access resources and build skills, the CCLP/OFOW framework provides an individual- **and** a systems-level view, in recognition of the role systems play in reinforcing inequities and their responsibility in addressing them. By providing both individual and systemic approaches, the framework recognizes how the two interact, and helps keep the focus on the end user, the individual. It also creates benchmarks against which the state can measure itself.
- *A living, adaptable document*: This framework will evolve based on input from partners and can be adapted to address the competencies needed for specific populations or regions. As the Digital Skills Catalog (explained in the next section) evolves, these specific skills and technologies will be embedded in the Digital Equity Framework. The OFOW will continue to update the framework based on feedback from partners, stakeholders, and others. If there are any errors, updates, ideas, questions, please don't hesitate to reach out to the OFOW at katherine.keegan@state.co.us.

Table 1. Digital Equity Framework - Brief Version (Full version available here)

Skillset	Level	Foundational Competencies (acknowledgement of digital inequity)	Stage 1 Competencies (digital inclusion activities)	Stage 2 Competencies (digital inclusion activities)	Stage 3 Competencies (digital inclusion activities)	Advanced Competencies (digital equity)
Digital skills for daily life	Individual	Individual understands technology as a necessary tool for daily life and has defined their digital literacy needs.	Individual has foundational skills required to use a device and participate online.	Individual is building their skillset and understands basic data ethics and security practices.	Individual can securely access information, communicate, and problem solve using technology.	Individual has a lifelong learning mindset with digital skill development.
	Systemic	Digital skill needs acknowledged across state systems. State compiles a resource list which includes resources currently available for digital skill development.	Statewide digital inclusion initiative created to coordinate resource list, expand training options for childrens and adults, support staff training, and improve community connections to resources.	Statewide digital inclusion initiative expands to include training development for professionals and navigation program to connect people with resources.	Statewide digital inclusion initiative expands to support employer adoption of digital literacy upskilling, incorporate technology developers, and building ongoing funding mechanism to support access to public systems^ for underserved communities.	Statewide digital inclusion initiative ensures ongoing access to digital literacy and upskilling opportunities for all Coloradans.
Connectivity/ Infrastructure	Individual	Individual understands the role of and need for connectivity to use technology.	Individual has determined how they will gain connectivity at home or another place when needed.	Individual has access to the internet at home or at an anchor institution.	Individual has consistent access to high-speed internet in their home or at an anchor institution to meet their needs.	Connectivity is a affordable, reliable, and accessible to meet the individual's needs at all times.
	Systemic	State acknowledges the need for a focus on broadband infrastructure and connectivity. State compiles a digital inclusion resource list which includes resources currently available for low cost high speed internet access.	Statewide digital inclusion initiative created to coordinate broadband infrastructure development and support access to low-cost high-speed internet.	Statewide digital inclusion initiative collects data on broadband access, identifies gaps, coordinates efforts to build infrastructure and increase access.	Statewide digital inclusion initiative ensures access at home or for free at anchor institutions. Workforce development strategy created.	Access to high speed internet is a public utility with statewide initiatives ensuring talent pipeline, resources, and coordination of ongoing development.
Equipment	Individual	Individual identifies the need to acquire adequate equipment or find affordable access.	Individual secures equipment through loan from public institution, low cost provider, or access to computer-lab.	Individual has access to equipment needed to meet their needs/goals, and knows how to solve equipment issues.	Individual has access to equipment, understands how to solve equipment issues, and understand how to maintain devices.	Individual is able to use most basic equipment and can assist others. Individual understand the importance of and performs good device maintenance.

Equipment	Systemic	State systems and leadership acknowledge the need for a statewide, sustained effort to ensure all Coloradans have access to web-enabled equipment. State compiles a digital inclusion resource list which includes resources currently available for free or low-cost equipment.	Statewide digital inclusion initiative created to coordinate distribution of equipment, conduct needs assessments, and fill gaps.	Statewide digital inclusion initiative builds partnerships with equipment suppliers to meet ongoing demand across the state.	Statewide digital inclusion initiative develops consistent revenue and supply sources to meet ongoing demand.	Access to reliable and affordable equipment is available to all Coloradans across 64 counties.
Digital skills for education, training, and work	Individual	Individual acknowledges the need to use technology for professional gain	Individual knows basic device operation to accomplish tasks and understand basic security practices.	Individual is building their digital skillset for education, training, and work and has the ability to construct information in a digital environment. Individual understands basic data ethics and security practices for the work and learning environment.	Individual can securely access, evaluate, produce and apply information across digital platforms. Individual can communicate and problem solve using technology.	Individual can comfortably create, collaborate, and communicate using a variety of digital tools. Individual has a lifelong learning mindset and applies it to digital skill development to advance their career.
	Systemic	Digital inclusion needs acknowledged across state systems. State compiles a digital inclusion resource list which includes resources currently available for upskilling.	Statewide digital inclusion initiative created to coordinate resource list, expand training options for childrens and adults, support staff training, and improve community connections to resources.	Statewide digital inclusion initiative expands to include training development for professionals and navigation program to connect people with resources.	Statewide digital inclusion initiative expands to support employer adoption of digital literacy upskilling, incorporate technology developers, and building ongoing funding mechanism to support program development for underserved communities.	Statewide digital inclusion initiative ensures ongoing access to digital literacy and upskilling opportunities for all Coloradans.

NOTES:
Frameworks Used: Office of Future of Work and Colorado Center on Law and Policy's Skills to Compete Coalition research; Markle Foundation's Digital Blindspot Report; ISTE Standards for Students; Seattle Digital Equity Initiative
*Systems that serve adults and children: Includes adult education providers; training programs; workforce programs; immigrant and refugee resource centers; senior resource centers, libraries, other public institutions.
^Public Systems: Includes frequently accessed public-facing systems such as SNAP, SNAP E & T, TANF, Workforce Centers (unemployment insurance, division of vocational rehab, employment and training), licensure, DMV, Medicaid and Medicare, libraries

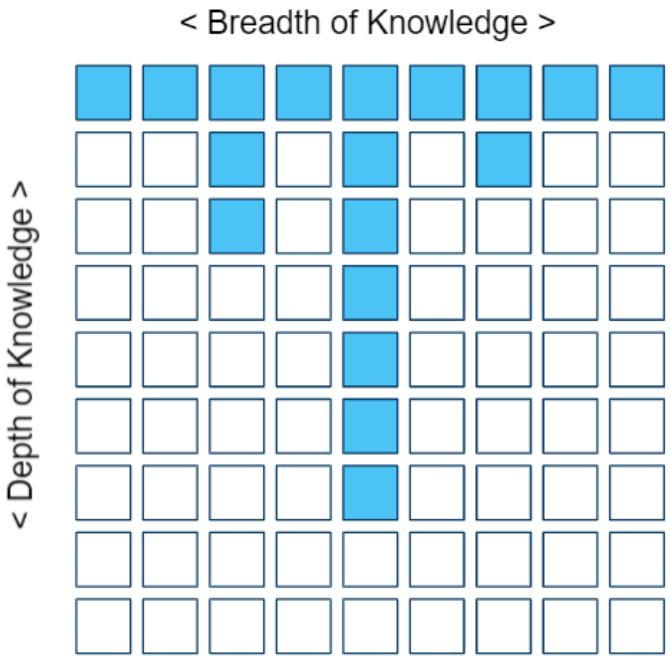
2. Digital Literacy Competencies for Daily Life, Learning, and the Future of Work

What Makes a Future-Ready Worker

Before diving into specific digital skills, it is important to understand what workers need to be prepared to meet the demands of the future of work, and how the pandemic has impacted those demands.

According to a recent study of eight major economies, over 100 million workers—about one in 16 workers—will need to find a different occupation by 2030 post-COVID-19.[7] In order to weather current and future transitions, workers must strategically build specific skills and mindsets. In their study of workers in the post-COVID economy, Emsi found that resilient workers are "T-shaped" (see Figure 2).[8] "T-shaped" workers are both generalists and specialists with a combination of broad experience and some specialization. Specifically, these workers will have a combination of human skills, technology skills, core business skills, and hard-to-find skills.

Figure 2. Visual representation of T-shaped skills (Emsi).



In their 2018 study of more than 56 million resumes and more than 150 million job postings since 2007, Burning Glass found a similar breakdown, identifying 14 "new foundational skill areas" that are in high demand, common to digitally intensive roles, and are already spreading

[7] Coursera (2021). Global Skills Report 2021. Retrieved at https://www.coursera.org/global-skills-report/skills?utm_cta_location_source=homepage-hero&utm_cta_text=get-report
[8] Coffey, C., Burrow, G., Sentz, R., Kirschner, K., & Saleh, Y. (2020). Resilient Skills. Emsi. Retrieved at https://economicmodeling.com/wp-content/uploads/2020/09/Resilient-Skills_full-report.pdf

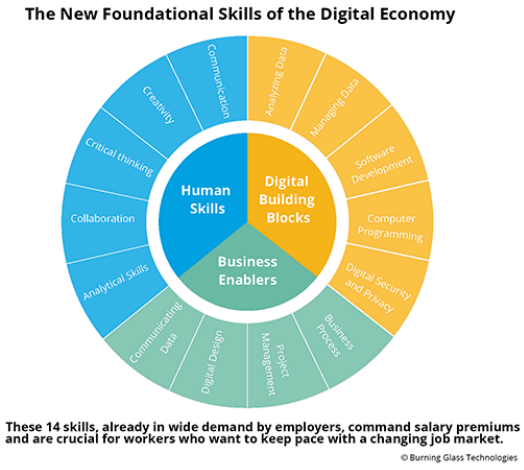
to less digitally driven parts of the economy (see Figure 3).[9] These 14 skill areas fell into three categories:

- **Human Skills** apply social, creative, and critical intelligence to problems. These skills – critical thinking, creativity, communication, analytical skills, collaboration, and relationship building – appear on many lists of sought-after "soft skills."
- **Digital Building Block Skills**, increasingly useful outside traditional digitally intense jobs, are especially useful to analysts and data-driven decision makers. These skills include analyzing data, managing data, software development, computer programming, and digital security and privacy.
- **Business Enabler Skills** allow other skills to be put to work in practical situations, and include project management, business process, communicating data, and digital design.[10]

The Burning Glass analysis found that individuals who have skills from **each of the three areas** are most likely to smoothly manage transitions and adapt as work evolves. However, only about 20 percent of workers currently include skills in all three of these areas on their resume.[11]

The labor market is more automated, digital, and dynamic than ever before. All learners and workers in all sectors will benefit from having this set of foundational skills so they can add value beyond that provided by technology and continually adapt to new ways of working.[12] In other words, each of these skill areas plays a key role in creating a well-rounded, resilient worker. **Though this report focuses on digital skills, it is important to remember that they are only part of the picture.**

Figure 3. The New Foundational Skills of the Digital Economy (Burning Glass).



[9] Markow, W., Hughes, D., & Bundy, A. (2018). The new foundational skills of the digital economy: Developing the professionals of the future. Burning Glass Technologies. Retrieved at burning-glass.com/research-project/new-foundational-skills
[10] Id.
[11] Id.
[12] Dondi, M., Klier, J., Panier, F. & Schubert, J. (2021). Defining the skills citizens will need in the future world of work. McKinsey & Company. Retrieved at https://www.mckinsey.com/industries/public-and-social-sector/our-insights/defining-the-skills-citizens-will-need-in-the-future-world-of-work

Digital Skills Catalog: What it Is and How to Use it

Despite the general consensus that digital skills are crucial for the future of work, there is very little understanding of what specific digital skills individuals need to achieve their personal and professional goals and how to improve individuals' digital literacy. To address this knowledge gap, the OFOW compiled data from its Finding a Job in COVID-19 Series and conducted a literature review of 10 reports from the following national thought and labor market data leaders:

- BCG - What's Trending in Jobs and Skills (September 2019)
- Burning Glass - New Foundational Skills of the Digital Economy (November 2018)
- Burning Glass - Skills of Mass Disruption (December 2020)
- EMSI - Resilient Skills (September 2020)
- Skillrise - Upskill with EdTech Framework: Preparing Adult Learners for the Future of Work (March 2019)
- Markle Foundation - Digital Blindspot: How Digital Literacy Can Create A More Resilient American Workforce (October 2019)
- LinkedIn Economic Graph - Insights Report (May 2021)
- McKinsey & Company - Defining the skills citizens will need in the future world of work (June 2021)
- Seattle Digital Equity Initiative - Digital Skills Framework (March 2019)
- World Economic Forum - The Future of Jobs Report 2020 (October 2020)

This review led to the identification of **244 unique digital skills/competencies required for work, learning, and daily life** which make up our Digital Skills Catalog, a **living document** that will be updated as new insights on digital skills in demand emerge.

How to Read the Digital Skill Catalog

The Digital Skill Catalog contains a variety of information for each skill, described below and shown in Figure 4:

- **Count** indicates the total number of skills on the chart in alphabetical order. This count column includes duplicates.
- **Name** of the skill/competency or skill cluster from the specific report.
- **Skill/Competency or Cluster** indicates whether the item listed is a single skill/competency or a cluster of related skills/competencies.
- **Domain** refers to the area of life in which an individual would apply the specific skill/competency or cluster of skills.
    - *Work*: a skill/competency or cluster useful in the workplace.
    - *Learning*: a skill/competency or cluster needed to effectively participate in digital learning, education, and training.
    - *Daily Life*: a skill/competency or cluster needed to use digital tools to participate effectively in daily life.

- **Relevance** refers to how the skill/competency or cluster applies to the domains
    - *Fundamental*: a skill/competency or cluster considered to be a baseline/core/foundational skill that should be at the top of the list to master.
    - *In Demand:* a skill/competency or cluster that is currently in-demand, growing, or expected to grow in the job market.
    - *Resilient:* a skill/competency or cluster that will support resilience in the evolving labor market.
    - *Cutting Edge:* a skill/competency or cluster that reflects very advanced digital skills, and though not currently in high demand, expected to grow rapidly with emerging industries in the future of work.
- **Source Note:** Many sources had additional categories or classifications for specific skill sets. When appropriate, we included the source information for additional context. For example, one report groups skills/competencies by cluster (e.g. Business Enabler) as well as by complexity (e.g. baseline, core, distinguished).
- **Geography** indicates the geographic parameters of the report from which the skill/competency or cluster came (e.g. worldwide, United States, or Colorado). This information provides context and addresses possible inconsistencies with other reports.
- **Source Link:** A hyperlink to the specific report from which the skill/competency or cluster came.
- **Date of Data** indicates when the data used in the report was analyzed or pulled. This date provides context and can address potential inconsistencies with other reports. Since work is transforming rapidly we will add updated data as frequently as possible.

Figure 4. Layout of the Digital Skills Catalog

			Domain			Relevance							
Count	Name	Skill/ Competency or Cluster	Work	Learning	Daily Life	Fundamental	In Demand	Resilient	Cutting Edge	Source Note	Geography	Source Link	Date of Data
1			Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N				

Viewers are able to sort and filter by category to focus on which aspects are most relevant to them (as showcased in the next section. The Catalog contains six tabs:

1. **“How To” and Glossary**: Includes this overview and the glossary for each column.
2. **Digital Skills Catalog**: The entire digital skills catalog.
3. **Duplicate Skills**: Includes details for the 25 skills that appear in the analysis’ multiple datasets .
4. **Work Domain Only**: Includes only the details for all skills that were categorized as part of the Work Domain.

5. **Learning Domain Only**: Includes only the details for all skills that were categorized as part of the Learning domain

6. **Daily Life Domain Only**: Includes only the details for all skills that were categorized as part of the Daily Life domain

If there are any errors, updates, ideas, questions, please don't hesitate to reach out to the OFOW at katherine.keegan@state.co.us.

Digital Skills by Domain and Relevance

Table 2 provides a summary of the skills in the catalog organized by their domain. In the Digital Skills Catalog there is a separate tab for each domain to facilitate deep dives. The vast majority (87 percent) of skills in the catalog apply to work, 22 percent apply to Daily Life, and 13 percent facilitate Learning. All of the skills specific to Daily Life, and all but one skill specific to Learning, are Fundamental (considered foundational/essential to the specific domain). None of the skills specific to the Learning and Daily Life domains are considered Cutting Edge, and few to none are associated with resilient jobs or resilient characteristics workers.

Table 2. Digital skills by domain and relevance

Domain Name	Total # of Skills in Domain	# of Skills that are Fundamental	# of Skills that are In Demand	# of Skills that are Resilient	# of Skills that are Cutting Edge
Work	241	48	102	154	49
Learning	35	34	0	1	0
Daily Life	60	60	2	0	0

Twenty-five skills appeared in multiple datasets in the analysis (Table 3). All of these skills fell into the Work domain. Only one of these skills is considered Fundamental: Microsoft Office. Seventeen of the skills are considered In Demand, 20 are Resilient, and seven are Cutting Edge based on this first analysis.

Table 3. Digital skills found in multiple analyses

Name	# of Occurrences
JavaScript	4
Big data analytics	3
C/C++	3
Data science	3
Data visualization	3
Python	3
Software Development Methodologies	3
Agile Software Development	2

Artificial intelligence	2
Data governance	2
Data lakes/reservoirs	2
Data warehousing	2
Debugging	2
Fintech	2
IT Automation	2
Java	2
Machine learning	2
Microsoft Office	2
Natural language processing	2
Quantum computing	2
Relational databases	2
Salesforce	2
Software development principles	2
Software engineering	2
SQL	2

Digital Skills Catalog: Next Steps

The OFOW will present the Digital Skills Catalog to workforce development, education, and digital inclusion partners across the state to gather feedback and inform next steps. In the next three months the OFOW will be adding definitions for each skill/competency and cluster listed. The OFOW will also explore adding industry/employer examples for the Cutting Edge skills, in particular.

Over the next year, the OFOW will work with the Colorado Department of Higher Education (CDHE) and training providers to identify where individuals could build and/or be assessed for the skills listed in the Catalog. As CDLE prepares to reskill, upskill, and next-skill Coloradans, the OFOW will explore building additional skill catalogs for human skills and business enablers. If you're interested in getting involved in this effort, please contact the OFOW at katherine.keegan@state.co.us.

3. Digital Equity Data and Gaps

With an understanding of the digital skills in demand, it is important to recognize the digital divide which limits the state's ability to capitalize on these emerging opportunities. The report provides an overview of existing data and then describes how the OFOW plans to access and use more data to close the divide.

Data on Internet Access and Adoption

As of November 2019, 4,541,527 of Coloradans (82.3 percent) were using the internet at home, 1,117,691 people (20.3 percent) were using the internet at a public access point, and 288,774 households (12.2 percent) had no internet access at home. Coloradan households that reported no internet use at home cited the following reasons[13]:

- 157,188 (54.4 percent) were not interested/did not see a need
- 55,637 (19.3 percent) said it was too expensive for them
- 10,318 (3.6 percent) could use the internet elsewhere
- 22,436 (7.8 percent) did not have internet available in their area
- 15,648 (5.4 percent) did not have a device to access internet with
- 3,361 (1.2 percent) had privacy or security concerns

Coloradan households with internet access at home reported the following subscription types[14]:

- 3,733 (0.2 percent) had dial-up service
- 4,056 (0.2 percent) had home internet access via publicly available service provided at no charge
- 11,559 (0.6 percent) purchased internet via a public agency, nonprofit, or cooperative
- 48,340 (2.3 percent) had internet provided as part of their building/apartment/condo costs
- 127,585 (6.1 percent) had satellite internet
- 1,775,777 (85.5 percent) had wired high speed internet
- 1,984,093 (95.5 percent) purchased internet from a private company

As of November 2019, 1,924,096 (89.9 percent) Coloradan households had a mobile plan.[15] According to a Colorado Futures study conducted in Colorado in May 2020[16]:

- Two-thirds of children living without the internet are Hispanic
- 49 percent of children without internet access are in elementary school.52 percent of children without internet live in households earning less than $50,000, with 25 percent in households earning less than $25,000
- A majority, 57 percent, of these children have at least one parent working in an essential industry

As of March 2021, 64,878 households with children in the K-12 system had inconsistent access to the internet for educational purposes.[17]

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[13] National Telecommunications and Information Administration (June 2020). Digital Nation Data Explorer. Retrieved at https://www.ntia.doc.gov/data/digital-nation-data-explorer#sel=onlineClassUser&demo=&pc=prop&disp=both
[14] Id.
[15] Id.
[16] Colorado Futures Center (May 2020). Who are Colorado's SchoolAge Children Without Access to Internet? Retrieved at https://www.coloradofuturescsu.org/wp-content/uploads/2020/04/colorado-remote-learning-impact-final.pdf

[17] U.S. Census Bureau (April 2021).Week 27 Household Pulse Survey: March 17- March 29. Retrieved at https://www.census.gov/data/tables/2021/demo/hhp/hhp27.html

Data on Access to Web-Enabled Technology

As of March 2021, 60,108 households in Colorado with children in the K-12 system have inconsistent access to computers for educational purposes.[18] As of November 2019[19]:

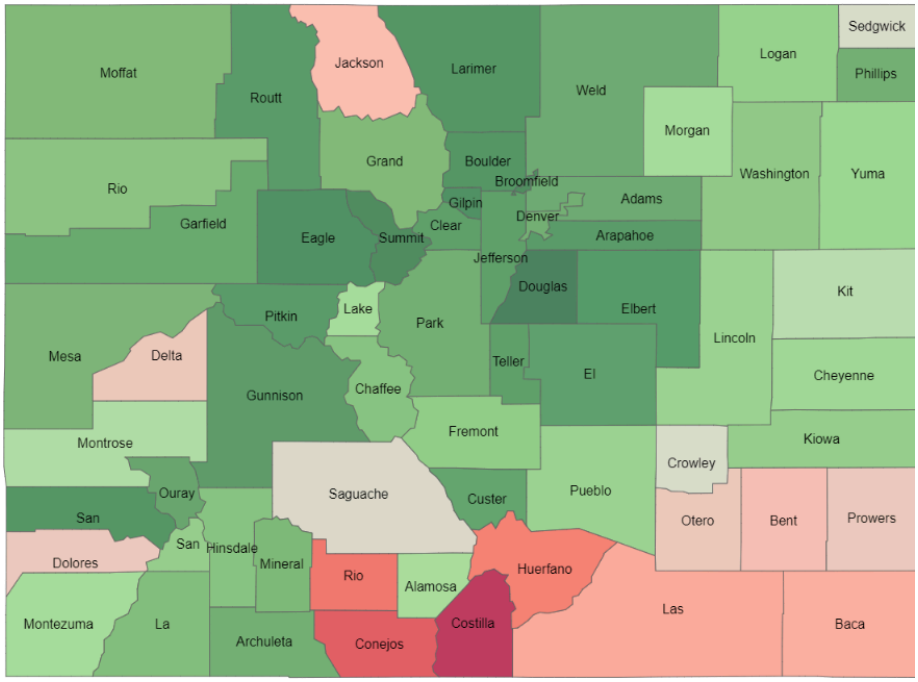
- 4,023,201 (72.9 percent) Coloradans use a smartphone
- 2,960,103 (53.6 percent) Coloradans use a laptop
- 1,515,566 (27.9 percent) Coloradans use a desktop computer

As of 2018, in Colorado[20]:

- 0.56 percent (11,818 households) have tablet only
- 4.15 percent (87,798 households) have smartphone only
- 7.15 percent (151,128 households) have no computer (See Figure x)
- 8.13 percent (171,728 households) have desktop or laptop only
- 79,94 percent (1,689,422 households) have more than one device

As shown in Figure 5, device gaps are most prevalent in southern counties, with Jackson and Delta counties also having a high percentage of households with no computer.

Figure 5. Percentage of households with no computer by county (Digitunity)



[18] Id.
[19] National Telecommunications and Information Administration (June 2020). Digital Nation Data Explorer. Retrieved at https://www.ntia.doc.gov/data/digital-nation-data-explorer#sel=onlineClassUser&demo=&pc=prop&disp=both
[20] Digitunity. Technology Gap Map. Retrieved at https://digitunity.org/the-issue/technology-gap-map/

Data on Digital Skill Development

Many U.S. workers across all industries lack the digital skills they need to ensure their continued success. A National Skills Coalition analysis of digital skills of the American workforce found that[21]:

- 13 percent of the workforce has no digital skills (workers who failed to meet 1 or more of 3 baseline criteria to even take the full digital skills assessment: prior computer use, willingness to take the computer-based assessment, or ability to complete 4 out of 6 very basic computer tasks, such as using a mouse or highlighting text on screen).
- 18 percent of the workforce has very limited skills (workers who can complete only very simple digital tasks with a generic interface and just a few simple steps; for example, these workers might struggle to sort emails that respond to an event invitation into different folders).
- 35 percent has achieved a baseline level of proficient skills

Workers with limited or no digital skills are present across all industries, age groups, and demographic groups.[22] Black/African American and Latinx workers are overrepresented among those with digital skill gaps; workers of all racial backgrounds feel that financial constraints are their greatest impediment to upskilling.[23]

4. Colorado's Approach to Digital Equity and Next Steps

Existing Efforts

As the Broadband Office and Broadband Advisory Board collaborate and coordinate efforts to improve access to high-speed internet, they have partnered with the CDLE's OFOW to increase digital literacy and inclusion. In March 2021, as directed by the Executive Order, the Broadband Advisory Board resolved to create the Subcommittee on Digital Literacy and Inclusion (SDLI) to discuss, research, analyze, and draw conclusions concerning digital literacy and inclusion and to provide regular updates to the Broadband Advisory Board concerning such discussions. The key responsibilities of the SDLI include:

- Coordinating and convening state level efforts to raise awareness of and address digital inequity
- Educating policymakers, local governments, and stakeholders on the importance of digital equity, common terms and definitions, themes, best practices, and available resources
- Developing policy supportive of digital equity
- Strengthening and supporting local digital equity ecosystems
- Guiding data, research, and best practices

[21] Bergson-Shilcock, A. (2020). The New Landscape of Digital Literacy: What policymakers and workforce advocates need to know. National Skills Coalition. Retrieved at https://m.nationalskillscoalition.org/resources/publications/file/New-Digital-Landscape-web.pdf
[22] Id.
[23] Id.

The SDLI will have three working groups to support digital literacy and inclusion efforts:

- **Policy:** Identify and/or design state and federal policy solutions for increasing digital equity at the individual, systems, local and state level.
- **Data:** Develop baseline of digital literacy and inclusion levels across Colorado communities and populations to inform 2022/2023 digital inclusion development goals for the state.
- **Promising Practices:** Research and identify promising practices to amplify, scale, or adopt in Colorado as part of the SDLI's efforts. Promising practices should consider each component of digital equity and the individual and systems level.

The launch of the SDLI took place on April 27, 2021 with 54 representatives from state agencies, city and county agencies, non-profit and community-based organizations, internet service providers, and education providers. The SDLI will meet bimonthly with working group meetings taking place in the alternating months. Updates from the SDLI will be provided at the monthly Broadband Advisory Board meetings, and initial recommendations from the SDLI will be submitted to the Broadband Advisory Board by December 2021. Working groups will then be assessed for their utility moving forward.

Beyond the SDLI, the OFOW's other efforts related to digital literacy and inclusion to date include:

- Launching a Digital Literacy and Inclusion website to house updates on efforts related to Digital Literacy and inclusion
- Partnering with Mile High United Way 2-1-1 to audit and update all the digital literacy and inclusion materials
- Delivering a technical assistance module with the Colorado Workforce Development Council (CWDC) to seven organizations to bridge the digital divide as part of their service delivery.
- Launching a partnership with CDHE and Fort Lewis College to build a digital inclusion program for college students.
- Launching the Remote Work Initiative with the CWDC, Office of Economic Development and International Trade, and the Economic Development Council of Colorado to equip workers, businesses, and communities with the tools they need to leverage remote work.
- Embedding digital inclusion into stimulus proposals and implementation; researching best practices from other states to inform Colorado efforts; offering digital literacy resources to state partners

Next Steps

There are many questions left to answer, and many challenges to address before Colorado reaches digital equity. Over the next year, the OFOW will:

- Publish case studies highlighting best practices to build digital equity into service delivery.
- Gather feedback and update the Digital Equity Competency Framework.
- Present the Digital Skills Catalog to workforce development, education, and digital inclusion partners across the state to gather feedback and update.
- Add definitions for each skill/competency and cluster listed.
- Explore adding industry/employer examples for the Cutting Edge skills, in particular.
- Identify where individuals could build and/or be assessed for the skills listed in the Catalog.
- Conduct landscape analysis of existing digital literacy programs and credentials and how digital skill-building efforts are woven into existing upskilling programs and policies
- Develop strategies to address any gaps in digital literacy programming to meet digital skill demand leveraging the education and workforce development ecosystem, including nonprofit providers with a particular focus on older workers, New Americans, people with disabilities, and the Black/Indigenous/People of Color (BIPOC) communities.
- Conduct digital navigator pilots with target populations to inform ongoing work
- Build a digital inclusion workforce development plan which will include data on talent development needs and proposed strategies to ensure Colorado has the talent pipeline in place to build broadband infrastructure and digital skills of Coloradans.