CHAPTER 4

Developing a Culture of Digital Literacy

KEY ISTE STANDARDS

This chapter addresses these ISTE Standards for Educators:

- Leader 2.2.a
- Collaborator 2.5.a

By the end of this chapter, you will:

- Understand the challenges of teaching digital literacy and how working together can help to solve them.
- Understand the opportunities for educators in various roles to support digital literacy across the school.
- Start to view yourself as a critical component of the digital literacy ecosystem.
- Understand the theory- and research-based rationale for working within a culture of digital literacy.

Digital Literacy Is Contextual

It could be argued that all modern schools now have a digital culture. Teachers use many technologies every day to do their jobs. On a typical day, you probably set up the technology for your first class before students even arrive. You may need to log time in a human resources application, upload worksheets to a learning management system, communicate with parents on ClassDojo (**ClassDojo.com**), create a presentation for the digital whiteboard, assign readings from a digital curricular resource and take attendance in attendance tracking software.

Students also use many technologies every day in school. For example, a student may start the day using their own mobile device to communicate with friends or catch up on YouTube videos. Then at school, they may log in to their school-issued device to play a game in Gimkit (**gimkit.com**), check the learning management system for due dates, or check their grades in the student information system.

One criticism of the term *digital literacy* is that it implies that one is either literate or illiterate with digital skills. In fact, digital literacy is contextual. One may have high digital literacy in spreadsheets but have low digital literacy in using a VR headset. A teacher may be excellent at creating digital instructional materials but uncomfortable running a Kahoot! (**kahoot.com**) presentation in class. In this chapter, we unpack how a learning culture can help to ensure that digital literacy becomes more of a growth mindset, rather than a label, which can improve as the school community utilizes the strengths of others.

Challenges to Teaching Digital Literacy

The sudden shift to remote, technology-based teaching at the start of the COVID-19 pandemic illuminated the challenges of teaching digital literacy in schools. Teachers who were used to face-to-face classes suddenly had to teach online, which requires a completely different set of teaching skills and tools. In addition, young students had to pivot to learning in their own homes, an environment typically reserved for leisure and family time. Teachers had to relearn how to deliver their content, while students had to reimagine their home life to include schooling, which included curating resources to learn online, finding learning spaces

at home to work, and learning how to learn online. If a school was not already technologically equipped with devices, a strong broadband system, and digitally competent teachers, then the pivot to remote learning was more challenging. Even for schools that were well prepared, families still struggled with using some of the educational systems.

The Digital Divide

The term *digital divide* is used to describe unequal access to technology. Each student's home may have varying access to smartphones, laptops, desktops, digital resources, and the internet. van Dijk & Hacker (2003) suggested that moving toward standards-based learning increased the digital divide as some geographic areas had greater access to the internet, funding to purchase and provide technology, and access to community resources with technology. In theory, providing technology to the people should create equity and reduce technical and economic barriers. Research has since found, however, that access alone is not enough to close the digital divide and that educators and information professionals (teachers and librarians) must work to help individuals learn how to use technology for information, communication, and creating new knowledge (Aqili & Moghaddam, 2008). For example, Boser (2013) reported that while low-income, non-white children used technology for basic drills and practice exercises, more affluent youth were able to use technology in more meaningful ways such as problem-solving and higher-order thinking.

In the book *Closing the Gap: Digital Equity Strategies for the K–12 Classroom*, it was explained that even as technology gaps close, there is still the digital-use gap (Thomas, et al., 2018). Some students have more access to digital mentors (and from an earlier age) than others, and those students tend to use technology for more meaningful learning than those who don't. Hiefield and Carter (2021) recommend that teachers avoid using technology for "drill and kill" to prepare students for tests and instead use technology to build research and inquiry skills, which will encourage less boredom, support critical thinking, and prepare them for lifelong learning outside of the classroom.

The research related to the challenges of teaching digital literacy has long established that the school infrastructure and teacher digital competence are two of the biggest challenges for digital initiatives in schools. If we think back to the influences in Figure 2.1, each of these challenges can have an impact on the digital literacy attained by students. For example, if the infrastructure does not support digital literacy, then students are unable to grow while they are in that environment.

Even though digital competence is essential for teaching, teachers tend to self-report low levels of digital competence. Sánchez-Cruzado et al. (2021) found that when they asked teachers to self-report their own digital competency during remote learning, many of the teachers reported very low digital competence. Using the DigComp 2.0 Framework, a European Digital Competence Framework designed to improve citizen's digital competence, they explained that teacher digital competence can be organized into five fields (Sánchez-Cruzado et al., 2021, p. 4):

- **Information and Information Literacy:** Identify, locate, retrieve, store, organize and analyze digital information, assessing its relevance and purpose for teaching needs.
- **Communication and Collaboration:** Communicate in digital environments, share resources via online tools, connect and collaborate with others through digital tools, and interact and participate in communities and networks, promoting intercultural awareness.
- **Creation of Digital Content:** Create and edit new digital content; integrate and rebuild prior knowledge and content; make artistic productions, multimedia content, and computer programming; and apply intellectual property rights and licenses.
- **Security:** Protect personal information and data, protect digital identity and digital content, understand security measures, and exercise responsible and safe use of technology.
- **Problem Resolution:** Identify needs in the use of digital resources, make informed decisions about the most appropriate digital tool depending on the purpose or need, solve conceptual problems through digital media or digital tools, and use technology.

Collaborating Across the School for Digital Literacy

The good news is that many schools have staff who are experts in the various areas of digital competence. By working together and understanding how educators in other roles are trained in specific areas, a digital learning culture can emerge. The first part of considering how to maximize the learning culture in a school is to understand the different agents in the schools and their involvement in digital literacy.

Classroom Teacher

Classroom teachers are highly trained in school and professional development on the newest technology and how to use it. They also use technology to communicate with their learning community, which includes parents and students. However, they may have different comfort and interest levels in integrating it into their instruction and differing abilities for using it to create educational content. While some teachers may want to use only a digital lightboard for presenting to students, others prefer to teach with digital games or even integrate design thinking, which can be applied to creating with technology. Classroom teachers often share what they have learned with each other and help each other as needed. In addition, they often have a support person of their choice who they contact within the school for help using technology. Teachers have high digital competence in communication and collaboration.

School Librarian

School librarians are educators who are also trained in information and media literacy, information resources, intellectual freedom, and inquiry. They are also often the technology experts in the school, being adept at using technology for learning as well as skilled at understanding the implications of technology. The school librarian has a mission to support students in the information seeking process, one which requires digital literacy skills.

Technology Coach

Technology coaches are educators who work specifically with teachers, helping them to teach with technology in their classrooms. Technology coaches are trained

in collaboration, student-centered approaches, and technology-enabled learning. If a building has a technology coach, that person may be the one primarily supporting teachers' digital literacy in schools, as well as offering guidance for integrating digital literacy into instruction. Technology coaches are able to model learning and work with technology, as well as encourage the development of digital learning experiences and assessments. School librarians and technology coaches have high digital competence in information literacy and creation of digital content.

Information Technology Staff

Every school has information technology (IT) staff who maintain the technology for the school's digital resources, including the internet connection, security, privacy, accessibility, internet filters, firewalls, storage, and the physical devices used within the school. IT staff often provide technical support to stakeholders and engage in purchasing technology, as well as integrating different systems (such as integrating the school information system with the library catalog). IT staff have high digital competence in security.

Administrator

Administrators include principals, coordinators, directors, and other leaderhip positions related to leading or supporting technology initiatives. Support from administration is critical to provide the funding, technical support and learning culture to ensure that a digital initiative will work. Administrators often advocate, secure funding, and develop scheduling critical to innovation in schools. Administrators at the school and district level are responsible for ensuring that school staff have adequate professional development for learning to use technology and professional development for teaching digital literacy. In addition, administrators are critical for establishing clear expectations for effective use of technology with students. In this role, administrators should also be aware of the flow of technology and digital skills instruction throughout the school. An administrator must have high digital competence in problem resolution.

Support Staff

Support staff can include secretaries, paraprofessionals, office workers, or any staff members who interact with students, parents, and teachers. At any time, support

staff may be asked questions related to technical support or using school technology to use the internet, access grades, view reports, communicate, or submit paperwork. Support staff who interact with the parent community often know the major challenges that parents and students are experiencing at home related to using school issued devices or software. Support staff have a strong understanding of the challenges that users face daily.

CONNECTIONS

Digital Learning Day

Since 2012, Digital Learning Day (#DLDay) has been an annual effort lead by All4Ed and Future Ready Schools where schools showcase their digital learning strategies (**all4ed.org/digital-learning-day**). While a culture of digital literacy is not limited to just one day, Digital Learning Day is one way to showcase the school's efforts related to digital literacy, ultimately leading to increased awareness and innovation within the school. Some of the ways that you can participate in Digital Learning Day are to:

- Showcase a favorite digital tool on Twitter with hashtag #DLDay.
- Attend a professional development session hosted by All4Ed on Digital Learning Day.
- Work with a tech coach or school librarian to set up a sharing board to share technology within the district or school to get new ideas from others, and share your own ideas.
- Involve students by hosting a contest involving technology, like video creation, stop motion animation, or coding.
- Set up a greenscreen for students to celebrate digital learning day by taking their own photos (and editing them).
- Choose one lesson that day and add an element of digital literacy to it. For example, if students are writing poetry, invite the school librarian to show students how to search the library catalog to find books in the school library with poetry in them.

Collaboration Between Educators

Did you know that collaboration is part of all the strands of the Future Ready Framework? It is, because through collaboration we can change a school's culture, including better support of digital literacy. Collaboration makes it possible to do more than can be done alone and provides a sense of community amongst those who do collaborate. In addition, students benefit from increased learning transfer as educators can build upon concepts as students move between classes.

CONNECTIONS: ISTE STANDARDS

2.4 Collaborator. Educators dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems.

Collaborating for digital literacy is the intentional effort to work together to implement digital literacy in various school settings. Not to be confused with collaboration as a digital literacy skill, collaborating between educators to teach digital literacy has potential to increase impact, while also creating a more seamless integration of digital literacy for students. Collaboration can occur at various levels, such as:

- Networking
- Cooperation
- Coordination
- Full collaboration

Table 4.1, which was adapted from Frey et al. (2006) for digital literacy initiatives, takes a closer look at each level.

TABLE 4.1 Levels of Collaboration

LEVEL	NETWORKING	COOPERATION	COORDINATION	FULL COLLABORATION
Description	Educators talk to each other and share practice.	Educators informally support each other's activities.	Educators work together on mutual projects that benefit all.	Educators create a formal agreement and work toward a shared vision.
How does this look for teaching digital literacy?	Educators share what they are doing to address digital literacy at meetings or other group settings. Educators share tools and strategies that work for them.	Educators share and exchange equipment or materials as others need it. Educators observe each other using technology. Educators promote each other's use of technology.	Educators work together on technology committees. Educators coordinate digital projects to further develop them. Educators use scope and sequence to build on digital skills.	Educators develop outcomes with the intention of distributing them in various classrooms. Educators combine resources to acquire technology or teach digital skills. Educators create training programs to develop digital skills.

What does collaboration look like in action? Look no further than Nina Boyett, a media assistant at Newport High School, who is working to develop a culture of digital literacy in her school (personal communication, March 19, 2023). To do this, she has tried to make the library a comfortable place for students to spend time before and after school, as well as during lunch. This has led to other teachers bringing their classes to the library for free-choice reading; a strategy known to increase student digital literacy is enabling students to search for what they like to read! To continue to build the culture of digital literacy, Boyett has joined the district's Computer Science for All (C/S for All) group, which emphasizes teaching technology as an important issue. The library will serve as a central point for technology support and management as the school increases their technological infrastructure

with new equipment and devices. Boyett recognizes that this will be a great opportunity for teaching digital literacy and collaborating with other educators. Table 4.2 includes an example of how these simple strategies might look with the Four Corners Framework.

TABLE 4.2 Alignment with the Four Corners Framework (Designer 2.5.a)

INTEGRATION	An English teacher is able to create free-choice reading time in class, and co-teaches with the school librarian who shows students how to use readers advisory websites (like NoveList; ebsco.com/novelist) and the library catalog to find a book they want to read.
CULTURE	This collaboration between the English teacher and librarian has lead to the librarian creating more reading spaces in the library, as well as spaces for students to charge their laptops and phones, or access the library catalog on a tablet. Students are now using this space and resources in class, but also before and after school.
MODELING	To show the students how to use reader advisory websites to find the next book to read, the librarian models how this might be done with one example of a book in a series. After this demonstration, the librarian then models how to find this book in the library catalog, and retrieve it from the shelf. Students also model independent reading as they enjoy the library space with the book they found.
MENTORSHIP	Mentorship can happen at many levels in this scenario. First, the school librarian is able to mentor the teacher on using library resources, and the teacher is able to mentor the school librarian on student interests. Students are also able to help each other by sharing their favorite reader's advisory sites, and talking about the books they are reading.

Digital Literacy Within the Disciplines

While many digital literacy skills, like evaluating sources or communicating online, are transferable to other disciplines, some skills are more critical for accomplishing deeper learning within each discipline (see Table 4.3). For example, as a history concept, a student may need to understand the *digital footprint* (also referred to as a *digital tattoo*) as a modern strategy for documenting historical information. This could also be used to introduce the concept of primary sources and how historical information was gathered before the internet. Table 4.3 elaborates on other content areas.

TABLE 4.3 Unique Digital Literacy Concerns Within Major Content Areas

CONTENT AREA	Unique Digital Literacy Concerns
READING & LANGUAGE ARTS	As students learn to read, they rely on the technical skills to use ebooks and e-resources, but also the tools built within these resources that enable them to define words, hear pronunciations, annotate, or navigate within the interface. In addition, digital literacy for reading involves being able to use tools to find new items that interest readers and assess if what they are reading is true (Picton et al., 2022).
MATH	In math, students need to pose a question, gather data, analyze it and then enterprise the results. This requires knowledge of e-resources to solve problems appropriately, as well as technical skills for using technology for math (Kim How et al., 2022).
SCIENCE	In science, digital literacy involves technical knowledge of equipment, such as digital microscopes and evaluation of reliable sources, as well as the ability to create such multimodal representations as diagrams, concept maps, tables, graphs, and three-dimensional models (Göjdas & Çam, 2022; Ng, 2011).
SOCIAL STUDIES	Students of social studies use digital literacy to evaluate authenticity and credibility of content and digital resources, which help them to learn the concepts of direction, location, and place to understand their communities and cities. They must also understand primary sources, maps, and media (Manfra & Holmes, 2020).

Digital Literacy Across the Disciplines

We co-edited a book for higher education educators that described how digital literacy is taught in various disciplines and with the intention of preparing students for a career that will likely include technology and digital skills (Hays & Kammer, 2021a). The presumption was that digital literacy is woven throughout all content areas and that the opportunities for teaching digital literacy are abundant in higher education. In K–12 schools, this is even more so as students often visit many different educators within the building on a regular basis.

Hobbs and Coiro (2016) recommend the WOVEN (Written, Oral, Visual, Electronic, and Nonverbal) communication approach, a teaching strategy used at Georgia Tech to emphasize creating ideas in multiple modes. This multimodal approach builds digital and media literacy in students as they learn to communicate and collaborate using a variety of media, including print and digital. In K–12 grades, WOVEN

can be used within one classroom or across classrooms. For example, students may learn to write a script for a video in an English class (written communication), deliver that script in a speech class (oral communication), design slides and visuals for the video in an art class (visual communication), add sound and media in a music class (electronic communication), then introduce the video to parents at an event using nonverbal skills. (Scan the QR code for more detail.)

GEORGIA TECH'S WOVEN APPROACH

In an article describing how librarians build community, King and Kammer (2023) shared one example of how this interdisciplinary collaboration might look within an elementary school. In this example, a school in St. Charles, MO, has a student-created morning broadcast, which is organized by the school librarian in collaboration with other teachers whose students are creating content. These students learn many of the communication skills that are also part of WOVEN as they implement all modalities of communication when creating the broadcast, made possible by the support of a network of creative educators.

Critical Considerations for Technology Use

Most of the discussion in this book has been about using technology in schools. However, the modern education system relies on technology use outside of the school building as well. Technology and connectivity, coupled with the digital skills to use it, are increasingly important for educational opportunity. Students need technology at home to do their homework, access coursework on snow days, or even take online courses as they get older. Parents also use technology to access student grades, communicate with teachers, and communicate with the schools. Teachers also rely on technology to do their job away from the building, whether that means teaching remotely or creating content for class.

The problem is that although many low- and moderate-income families do have access to the internet, they may only have access through their mobile devices and may experience inconsistent connectivity. Rideout and Katz (2016) found that this inequity was even more pronounced for immigrant Hispanic families who indicated that they do not get online at all. This report also found that children who had inconsistent access to the internet were also less likely to pursue their own educational interests while at home or use technology to create their own art or music.

During the COVID-19 pandemic, many schools that did not already provide mobile devices for students purchased them with COVID relief funding (U.S. Department of Education, 2021). One survey found that in 2021, 90% of schools had one device for every middle and high schooler, with 84% providing them for elementary students (Klein, 2021). This same survey found that many schools were not planning on heavily using 1:1 devices after remote learning ceased and students were back in the classroom, due to maintenance of devices and alternatives to working on screens.

CONNECTIONS

Distributing Digital Literacy in Schools

The African proverb "It takes a village to raise a child" conveys the notion that community efforts are needed to ensure that youth develop the resilience, knowledge, and abilities required to succeed in the modern world. We can apply this to digital literacy in that children cannot be taught digital literacy in a single lesson, by one instructor. Instead, distributing digital literacy across the curriculum is essential. Hague and Payton (2011) explained that developing digital literacy alongside subject areas is critical for preparing youth for a digital world. Youth use distributed and connected networks as a regular part of their lives.

How do you apply distributed digital literacy in your school? Here are a few tips:

- Meet with a tech coach or IT staff before teaching with technology to learn the best strategies and work out any issues in advance.
- Share what you learn from teaching with technology with other teachers.
- Feel confident to reach out to IT staff to alert them of problems students are having. For example, if a website that is needed for instruction is blocked, ask IT staff to consider adding it to the list of allowed sites.
- Collaborate with the school librarian to include more information and media literacy in lessons. For example, the school librarian can give instruction sessions on how to find quality research for papers, write citations, and much more.
- Allow students agency when using technology to create assignments. For example, instead of having students write a report, allow them to create media—a video, a podcast, a presentation, or other digital construction—to demonstrate learning.

Interdependence: Support for a Digital Learning Culture

What does a digital learning culture look like? Imagine a technology-rich classroom, where teachers and students are all tech-savvy, and equipped with the technology they need to be innovative and use technology to solve real-world problems. While such a learning environment is the goal, it takes time and hard work to reach. To make progress toward a culture like this, there must also be extensive support from administration in the form of time for both the teacher and student to innovate, funds to support the procurement of the latest equipment, and people to provide training and expertise on using it for teaching and learning. PBS Learning Media (2015) conducted a survey of teachers that found that teachers expected that the future of digital learning would require them to need more technology support, but also that they would be providing more technology support as well.

As such, building a digital learning culture requires interdependence. To advance digital literacy, a learning culture is possible only if technology users have the support needed to use technology. This support can come from many areas of the school. Administrators can provide funding for staff to provide technical support, like providing technology coaches and IT professionals. The technology staff can work closely with teachers to understand their needs and advocate for good policies, as well as teach teachers how to use technology for teaching or productivity. Teachers can support each other by sharing tips and techniques with each other. Teachers can also support students by taking time to model, mentor, or integrate technology into activities and assignments. This collaboration and network of caring is essential to developing a learning culture.

With an increase in school-issued devices comes new considerations for supporting the use of these devices, particularly remotely. Schools that switched quickly to 1:1 computing found they needed to provide digital training and more to staff and teachers, so they could in turn provide support to families who were using the devices. Klein reported how one school district had to train support staff in Spanish to support Spanish-speaking families who needed help learning to use the new devices their children brought home from school.

This poses the question: Can increased digital literacy reduce tech support needs? Many of the digital frameworks in use, including ISTE's Digital Skills for a Global

Society, focus on the skills needed to be an informed consumer, critical thinker, or creator. While these skills go beyond functionality, we argue that they are not possible unless technical skills are already present, for example, being technically literate enough to manage passwords, navigate websites, maintain a laptop, and manage device issues. A culture of digital literacy in a school would regularly examine the technical problems and concerns of using technology and create support for these issues. Support may include training, an FAQ page, a technical support phone and email address, policies designed to reduce problems with technology use, and walk-in help.

Incorporating the Simple Strategy of Building a Digital Culture

Now that we have considered the various types of culture building and reviewed examples, let's think about simple ways to implement these strategies:

CONNECTIONS: ISTE STANDARDS

2.2 Leader. Educators seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning.

- Ask a colleague what digital skills their students are strong in—or low in.
- Start a conversation on what has worked to improve such skills or what might improve digital skills if the sky was the limit!
- Talk to support staff at your school to understand more about the problems parents are reporting related to technology used. Consider if there are ways to address these with instruction, or tutorials.
- Get to know your IT department and technology staff to understand how to request changes. For example, you might want to request changes to permit content that is erroneously being blocked in your classroom.
- Give a professional development session on a technology that you use to show others how it can improve teaching and learning. Leave room for discussion and ideas so that new ways of using it can emerge.
- Talk to your administrators about ways in which they can support your use of technology. Ask for what you need.

- Approach technology with a growth mindset. This excitement will spread to others!
- In Chapter 3, you started with yourself and determined the habits of mind that you use. Now, identify what habits of mind are used by others and consider opportunities for collaboration.

The Research

Although we feel strongly from our own personal experiences that a learning culture has the potential to make a positive impact on digital literacy in the classroom, there is more than just anecdotal evidence to support this practice. Here are some links to research labs working in this area:

- **The Media Education Lab.** The Media Education Lab is a research lab at the University of Rhode Island that specializes in research, advocacy, and mentoring of digital and media literacy in education. Hobbs and Coiro (2016) explained how collaboration and overlapping disciplines led to development of this lab and its subsequent Summer Institute in Digital Literacy, which brings together teachers, librarians, and media professionals to explore the practical implications of digital literacy. Scan the QR code to find more lesson plans on digital literacy at the Media Education Lab website (**mediaeducationlab.com**).

MEDIA EDUCATION LAB

- **The Connected Learning Lab.** The Connected Learning Lab is a research unit from the University of California, Irvine. Researchers study how youth can mobilize learning technology within a social network of mentors and peers so that they can eventually use technology to open opportunities. On the lab's website, you can find projects, research, and additional resources for using technology with youth to support their own interests, while also building relationships and opportunities (scan the QR code for more; **connectedlearning.uci.edu/projects**).

CONNECTED LEARNING LAB

Chapter 4 Takeaways

In this section, the important takeaways from the chapter are paired with the ISTE Standards for Educators that inform them.

- Advancing digital literacy requires utilizing the creative network of educators and staff who work to support teaching, learning and technology in schools (Collaborator 2.4.a).
- Sharing your use of technology and digital resources is a simple way to distribute digital literacy throughout the school and can help to support a shared vision of empowered learning (Leader 2.2.a, 2.2.c.).

Reflection

Before moving on, take some time to consider how the ideas in Chapter 4 apply within your context using the questions below.

- Who are the people who support digital literacy in your school?
- What problems could you solve by collaborating at different levels with other educators?
- Explore some of the research shared. Was there a school or classroom example that resonated with you? Why?