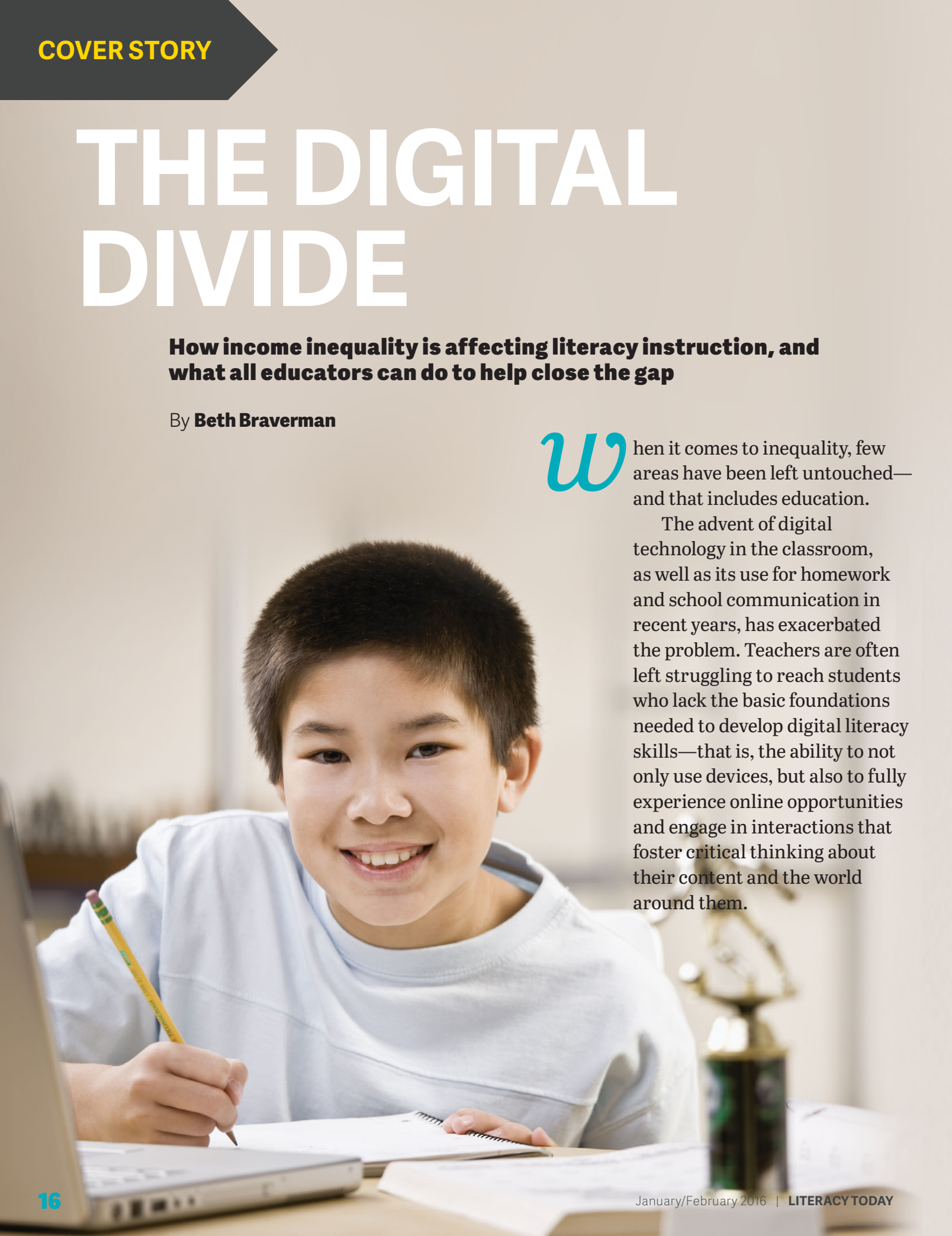
THE DIGITAL DIVIDE

How income inequality is affecting literacy instruction, and what all educators can do to help close the gap

By **Beth Braverman**

When it comes to inequality, few areas have been left untouched—and that includes education.

The advent of digital technology in the classroom, as well as its use for homework and school communication in recent years, has exacerbated the problem. Teachers are often left struggling to reach students who lack the basic foundations needed to develop digital literacy skills—that is, the ability to not only use devices, but also to fully experience online opportunities and engage in interactions that foster critical thinking about their content and the world around them.



"While some disadvantaged people undoubtedly gain much through their engagement with digital education, this is not usually replicated on a wide-scale basis across populations," says Neil Selwyn, an education professor at Monash University in Australia and author of *Education in a Digital World: Global Perspectives on Technology and Education* (Routledge). "There is little sustained evidence of any wholesale democratization of education through digital technologies."

Instead, Selwyn says, digital technology tends to reinforce the "Matthew Effect," helping most those students who are already doing well.

The literacy gap between the richest and poorest students has been documented in several studies, and a separate achievement gap exists for online reading, according to a 2014 *Reading Research Quarterly* article titled, "The New Literacies of Online Research and Comprehension: Rethinking the Reading Achievement Gap." Published by researchers from the University of Connecticut led by Donald J. Leu, the report found the online research and comprehension gap represents "more than one additional year of annual growth at the middle school level beyond that reported for offline reading."

Schools are wired, but the connections are slow

The term *digital divide* arose in the 1990s to reflect the growing gap between those who had access to the Internet and those who did not. After a concerted effort throughout the early 2000s, most classroom computers in developed countries—in rich or poor areas—are Internet enabled. Many of those connections, however, rely on older connections that don't have the capacity to handle hundreds of students and teachers using their devices at once.

In the United States, for example, the Obama administration launched ConnectED, an initiative to upgrade the Internet infrastructure and put broadband, wireless connections in 99% of schools by 2018.

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That's going to be a heavy lift. Approximately 23% of schools still lack adequate broadband, and 40% lack Wi-Fi, according to EducationSuperHighway, a nonprofit that works with education officials to bring broadband to schools. Likewise, according to a 2013 report from the European Commission, between 3 and 7 students use one computer on average in the European Union; and although 9 out of 10 students are in schools with broadband, slow connections and insufficient equipment are reported to be the main obstacles to more complete integration.

The demand is only going to grow as more schools implement 1:1 programs, which give every student laptops or tablets.

These 1:1 programs are seen across the globe. Uruguay was the first in the world to implement one countrywide for primary school students with its pioneering Plan Ceibal program. Thailand and Turkey have implemented similar programs, but with tablets. While there are criticisms of 1:1 programs, these programs have also shown results. A 2012 review by Stanford University of One Laptop Per Child, a program which provides free, connected laptops to children in impoverished communities, found that participants in Beijing showed improved computer skills after six months and higher self-esteem. They also spent less time watching television. A 2013 follow-up study confirmed the findings.

The sixth and seventh graders at Brooklyn Laboratory Charter School, 33% of whom have learning disabilities and 60% of whom have no Internet access at home, experienced an average of 3.2 years of growth in reading in the school's first year in operation.

Every student at that school gets a Chromebook, and students without strong digital literacy skills get an extra week of instruction before the start of school in basics like checking e-mail and connecting to Wi-Fi. "Many students come to us mobile literate but not digital literate," says school cofounder Erin Mote.

In addition to integrating technology throughout the curriculum to build upon critical skills and make real-world connections, the school provides daily two-hour sessions of individual and small-group tutoring and works with community partners to find places where students can get online for assignments outside of school.

Having reliable Internet access makes a huge difference to teachers as well. Nearly 70% of teachers say having technology in the classroom lets them do more with students, and two thirds would like to see more technology in the classroom, according to a 2013 survey by PBS LearningMedia. The percentage who want more in their classrooms jumps to 75% among teachers at low-income schools.

The ultimate goal is to achieve "techquity"—in which technology is used to create an equitable education system. Selwyn says it's key not to conflate equality and equity when it comes to digital technology. "Giving every student access to the same devices is not going to reduce differences or make education fairer," he says. "Equitable approaches to digital education are concerned with ensuring every student gets whatever different things they might personally require."

When used appropriately—which typically means with close adult supervision and training at home or at school—technology does have the potential to narrow achievement gaps. A September 2014 report by researchers at Stanford University, "Using Technology to Support At-Risk Students' Learning," found the most successful technology integration

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programs targeting at-risk students include 1:1 computer access and high-speed Internet access.

Other studies show results for even the youngest students. A December 2014 study published in the *Journal of Literacy and Technology* found that integrating e-books into early childhood education programs can provide measurable results within six weeks for children at risk for poor reading outcomes.

"While technology is not a cure-all for all that ails education today, it is a vital part of the solution," says Chike Aguh, chief programs officer for EveryoneOn, a nonprofit aimed at securing low-cost Internet for low-income homes.

Making the most of technology integration

In addition to basic connectivity, the divide is also about how those who are connected to the Internet make use of that connection.

Even in schools with the latest technology, many teachers are not focused on imparting digital literacy skills. For some teachers, that's a reflection of a lack of knowledge or confidence, says Leu. For others, it's a matter of prioritizing. In low-income schools in particular, where test scores are often low and there's an overwhelming focus on raising them, teachers are so focused on teaching to the tests that they may ignore digital literacy. The words *Internet* and *online* do not appear anywhere in the Common Core reading standards, Leu points out.

"It's a double whammy for those families that are economically challenged," Leu adds. "They have the least technology in their homes, and they're getting less instruction on it at school because all the emphasis is on the tests."

The 2014 Stanford study found affluent schools used technology to create interactive lesson plans tailored to individual students. By contrast, teachers in low-income schools used a "drill-and-kill" approach with technology, employing it to help with memorization for standardized tests. A separate study by Matthew Rafalow at the University of California, Irvine, published in 2014 in the *International Journal of Sociology of Education*, found teachers in affluent schools with interactive whiteboards use many of the device's advanced functions, whereas those in lower income schools use them as traditional blackboards.

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Also, teachers who know many of their students don't have Internet access at home might avoid assignments that rely heavily on Internet research. Although that gives all students the ability to complete an assignment, it also keeps them from practicing the new literacy skills needed to evaluate online information and content critically.

"There's an expectation that students already know how to 'Google' something, but they may not," says Susan Neuman, a professor of childhood and literacy education at New York University. "A student may not have had the opportunity to do that, and they may have limited opportunity in school to do an independent project that involves technology."

Globally, teachers cite the need for more professional development in digital literacy pedagogy and practices as one of their most pressing needs, according to a report issued in 2014 by the Organization for Economic Co-operation and Development.

Leu says more professional development is required to help teachers determine the best way to integrate technology and tap into their potential to close—rather than inadvertently add to—the divide among students. Digital tools, after all, allow for a level of differentiation in instruction that could help teachers reach all students in a classroom at the appropriate level, a task that's nearly impossible in today's diverse classrooms, Neuman says.

Leu adds professional development should focus on "helping the last become first." That is, when a new technology is introduced to the classroom, teachers should teach it first to the students who are the furthest behind. "The basic principle is to get those students to be experts and have them teach the other students these new literacies," he says. "Then those students become more confident and it carries over into traditional book reading. It can have profound effects."

For teachers of younger students, professional development should include training on how long it's appropriate to use screens in the classroom and how to evaluate the quality of digital media, Neuman adds.

The ability to think critically about digital information and adapt quickly to technology, which is evolving at a breakneck pace, are among the most valuable skills needed by today's students. Students from higher income families enter school with more comfort and experience with technology, and they build on that advantage and ultimately become more desirable workers to employers.

Without basic digital literacy, today's high school students would have trouble even researching and applying to college, Leu says.

"The pace of change will probably increase," says Karen Cator, chief executive officer of Digital Promise, a nonprofit with the goal of accelerating innovation in education. "What that means is that every person must know how to learn lifelong and life-wide, inside of school, outside of school, and throughout their life. The ability to learn, to take in new information, to read and be literate online, these things are more and more important."

Bringing the technology home

Any efforts to bridge the inequality gap when it comes to technology must go beyond the school. Students who grow up with smartphones, computers, and tablets are far more comfortable with the technology and come in to school with a leg up on peers without those advantages.

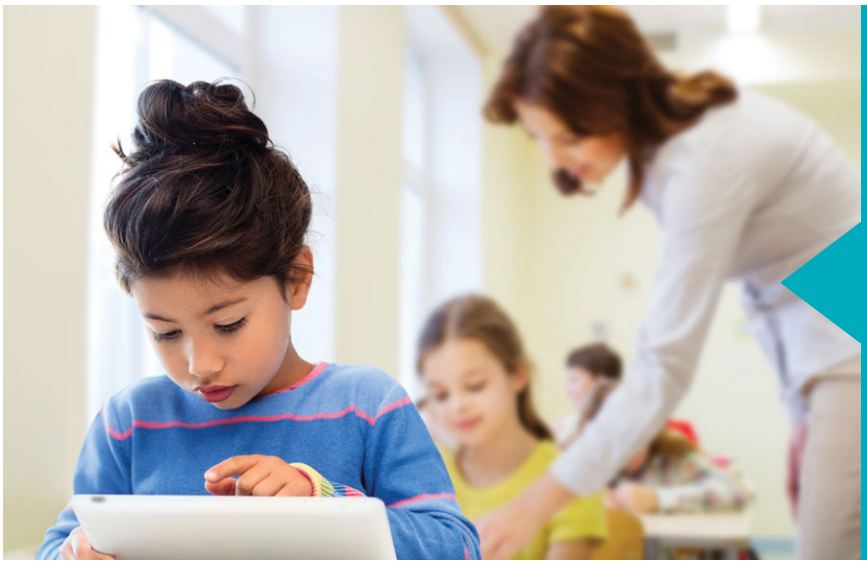
"For technology and education to truly have an impact, the technology cannot simply be bounded by the walls of the schoolhouse," Aguh says. "That connectivity and the device have to follow the student home in a way that's equitable, affordable, and fair."

Internet usage at home varies greatly by country. For example, according to a United States Census report released in 2014, 98% of homes with an income of $150,000 or more have a computer, and 95% of those homes have high-speed Internet. By contrast, just 62% of homes making less than $25,000 have computers, and less than half of those homes have high-speed Internet. In Europe, statistics from the European Commission show Internet access at home ranges per country, from 54% to 88%. And although only 15% of the population in Africa has a connection, Internet usage has skyrocketed faster than any other region, according to the United Nations.

Libraries and community centers have tried to bridge the gap, providing public, Internet-equipped computers, but students generally have to wait in line, and they're available only during limited hours. When students do get access in libraries, typical time limits make it nearly impossible to do an in-depth research project or any independent research unrelated to school, and filters can limit their access. "That's just not the same access a student has with a computer at home who can get on it anytime they want to," says Donna Celano, a LaSalle University professor and coauthor with Neuman of *Give Our Children a Fighting Chance: Poverty, Literacy, and the Development of Information Capital* (Teachers College Press).

Progress has been made, as more schools implement 1:1 programs, nonprofits help the neediest families secure discounted Internet access, and falling prices make it easier for many low-income families to purchase technology.

Both Florida and North Carolina have announced plans to convert in coming years to digital textbooks, with students accessing those books via tablets. But the success of those programs also hinges on the assumption that all children have



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access to the Internet at home. "That's an obligation that [we have] yet to fulfill," Leu says.

The Federal Communications Commission in the United States is currently overhauling its Lifeline program, which subsidizes phone service for low-income families, to cover broadband access as well.

The next step, once students are connected and have access at home and in school, is to teach everyone who lives with the student how to use those devices effectively. "We still have adults in high-poverty communities who don't know e-mail and don't know the basics of Internet use," Neuman says.

Children without a digitally savvy adult at home are more likely to use the Internet for entertainment purposes like watching a movie or communicating with friends via a social network than to do research or download an educational app, studies show. "Having the technology is great," Celano adds. "But you also have to have a capable adult helping children use it."

What can be done

Although many of the problems associated with the digital divide require action at the school district, state, or national level, teachers shouldn't feel intimidated. Educators can get involved by using any technology they do have in the classroom in authentic and meaningful ways, teaching digital skills and digital literacy from an early age, and not losing focus in the face of inherent challenges. Teachers can also advocate for upgrades on behalf of students.

Here's what you can do:

- Encourage your district to take the Future Ready District Pledge, which reflects a commitment to work with stakeholders on a vision for digital learning. Future Ready Regional Summits allow educators and administrators to learn about best practices for bringing the best of technology into the classroom.
- Enhance your own classroom technology skills and literacies via the courses available at Common Sense Media and similar organizations. Start discussions about bringing more technology-focused professional development programs on site.
- Look for ways to integrate technology creatively into all of your lesson plans, such as having students write blogs or record podcasts. Allow some "play time" for students on classroom devices so that they build skills organically.
- Be vocal about the importance of keeping devices up-to-date. "If the poor state of technology in schools was as high profile an issue as Common Core or standardized testing, then we might see some changes," Selwyn says.
- Always remember where your students are coming from and what their experiences at home may be like, and keep in mind Leu's advice: to help the last become first.

Reflecting on an Educator's Role in the Digital Divide

As teachers, our personal learning mind-set and digital literacy greatly influence our ability to break barriers when it comes to discussing the digital divide.

The following are considerations to make when addressing the digital divide:

1. **Rethink what options you have and complete a learning needs assessment.** Focus on a change in practice over the technology. Ask yourself, "How will technology improve the learning that is already happening? What change in my practice will help support the learning that is already happening? What kinds of technology and tools would support a change or improvement?"

   Consider Ruben Puentedura's SAMR model, which leads an educator through the steps of substitution, augmentation, modification, and redefinition when infusing technology in learning.

2. **Consider the culture of your learning context.** Who makes up the learners in your community? Darryl Adams, superintendent of Coachella Valley USD in California, realized that a Wi-Fi on Wheels program would meet the needs of the most learners within his district. Learning the cultural contexts and needs of a district, rather than making assumptions, will help provide timely authentic solutions.

3. **Reflect on your own learning.** Consider these standards created by leading experts to reflect upon your own digital literacy:

   - Mozilla Webmaker/Web Literacy Map: wiki.mozilla.org/Webmaker/WebLiteracyMap
   - iNACOL Blended Learning Teacher Competency Framework: inacol.org/resource/inacol-blended-learning-teacher-competency-framework
   - ISTE Standards: iste.org/docs/pdfs/20-14_ISTE_Standards-T_PDF.pdf
   - Wendy Oliver's Blended Practice Profile: blendedpractice.com/framework

4. **Remember you cannot do this by yourself.** Being connected is the way to bridge the digital divide. Contact supporters within your district, become a Connected Educator (connectededucators.org), consider personal learning networks, and connect and learn with others through social media (try #ILAchat or #edchat).

5. **Know that you can make a difference.** This might be the most important of all.

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