

# Digital Literacy, Libraries, and Public Policy

Report of the Office for Information Technology Policy's  
Digital Literacy Task Force

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In our technology-saturated culture, there is an emerging understanding that access to technology is only a part of the solution needed to ensure digital inclusion and empowerment. Increasing digital skills and competencies make up the rest of this equation. Twenty-first century digital literacy skills are basic to classroom performance and workforce readiness, as well as full participation in civic life.

America's libraries are on the front lines of digital inclusion and digital literacy efforts nationwide. America's libraries are uniquely positioned to provide the access to technology and support digital literacy development. About 120,000 K-12 school, higher-education and public libraries reach and serve people of all ages, income levels and ethnicities in the United States. They serve as information hubs, conveners and collaborators within their educational and community contexts.

In addition to supporting access to information, community development and lifelong learning, libraries continue to support literacy. Literacy remains central to the ability to learn, grow and achieve in society. Libraries support all literacies—from basic reading and writing to digital literacy to literacies in specialized areas like health, financial or government information. Libraries meet people where they are and provide supports that deepen the literacy skills needed for people to survive and thrive in the digital age.

Policymaking should reflect multiple dimensions: digital literacy is the ability to use information and communication technologies to *find, understand, evaluate, create* and *communicate digital* information. Basic reading and writing skills are foundational; and true digital literacy requires both cognitive and technical skills.

This report explores the major policy dimensions implicated in digital literacy and the ways in which libraries are working to ensure that everyone may fully participate in the 21<sup>st</sup> economy and society.

The American Library Association's (ALA) Office for Information Technology Policy (OITP) launched the OITP Digital Literacy Task Force in spring 2011 and brought together literacy experts and practitioners from school, academic, and public libraries to address opportunities and challenges related to digital literacy and associated national policy conversations (see the Appendix for a list of task force members and their affiliations). The task force concludes that America's libraries are uniquely positioned to deepen the literacies needed for all people to thrive in the digital age.

This report provides a broad overview of the role of libraries in digital literacy. After briefly defining what is meant by "digital literacy," it examines the current policy context and the interrelationships among digital inclusion, education, lifelong learning, and workforce

development. The report then outlines in turn issues and opportunities specific to school (K-12), academic (higher-education), and public libraries with respect to supporting and fostering digital literacy. In so doing, it reaffirms the need for traditional, text-based literacy in reading and writing as a foundation for other literacies.

This report provides the basis for the task force's recommendations to ALA and the broader library community. The report takes as a given that technologies and their impacts on how people find, use, evaluate, and create information resources will continue to evolve, as will the terms with which they are described.

## Digital Literacy & Libraries

One of the task force's first acts was to determine a common definition of digital literacy that would speak to all types of libraries and the diverse communities they serve:

Digital literacy is the ability to use information and communication technologies to find, understand, evaluate, create, and communicate digital information, an ability that requires both cognitive and technical skills.

A digitally literate person:

- possesses the variety of skills—cognitive and technical—required to find, understand, evaluate, create, and communicate digital information in a wide variety of formats;
- is able to use diverse technologies appropriately and effectively to search for and retrieve information, interpret search results, and judge the quality of the information retrieved;
- understands the relationships among technology, lifelong learning, personal privacy, and appropriate stewardship of information;
- uses these skills and the appropriate technologies to communicate and collaborate with peers, colleagues, family, and on occasion the general public;
- uses these skills to participate actively in civic society and contribute to a vibrant, informed, and engaged community.

It cannot be overstated that digital literacy must include mastery of traditional literacy. Although digital literacy skills will necessarily change as technology evolves, being digitally literate will continue to require basic reading and writing skills, access to up-to-date digital instruction, and a commitment to lifelong learning.

The public's attainment of twenty-first century digital literacy skills is essential if the United States is to compete economically, educationally, and intellectually in the global environment. Two major federal initiatives—the National Broadband Plan, released in 2010, and the Broadband Technology Opportunities Program, initiated in 2009—focused national attention on digital inclusion and spurred government agencies to develop policies and programs to

expand broadband access and adoption as one important component of digital inclusion.<sup>1</sup> The National Broadband Plan notes that “absent action, the individual and societal costs of digital exclusion [will] continue to grow.”<sup>2</sup> The concept of digital literacy also is a thread throughout the Common Core State Standards Initiative for K-12 schools, which had been adopted by 45 states and three territories as of November 2012.<sup>3</sup>

Broadband Internet access is essential, but access alone is not enough. Basic computer skills and high-level cognitive skills for finding, evaluating, ethically using, creating, and sharing information also are required for digitally inclusive communities.<sup>4</sup> The Federal Communications Commission (FCC) estimates that 66 million people in the United States lack basic digital literacy skills.<sup>5</sup> This skills gap constitutes a second digital divide that demands solutions to ensure that the American public is prepared for global leadership positions.

### **Broadbandexpress@yourlibrary: New York State Library’s Broadband Technology Opportunities Program (BTOP) Project**

As its BTOP project, New York State Library created new public computing centers in libraries across the state, as well as five mobile labs to bring broadband to remote areas. Staff report the greatest success when digital literacy skills are taught in a context that engages learners and provides them with an immediate positive outcome. In one BTOP library, for example, librarians have created classes on Internet searching based on planning for a family trip. Participants research the destination and other components necessary for a trip, and compare travel costs and options. By the end of the class, they have practiced searching websites, evaluating the information they find, and documenting the information in a written format. Such classes provide learners with transferrable skills in a personally relevant framework.

America’s libraries and librarians are on the front lines of digital inclusion and digital literacy efforts nationwide. There are approximately 99,000 K-12 school libraries, 3,800 college and university libraries, and 17,000 public library buildings in the United States.<sup>6</sup> These libraries, staffed by approximately 150,000 librarians, provide access to technology resources and services, as well as robust and relevant collections of electronic and print materials. By supporting contextual digital literacy training—that is, tying formal classes directly to relevant purposes, such as learning to use office software to write a résumé that is then attached in an email and sent to a job board found through a guided Internet search—librarians encourage and support skill building, as well as provide opportunities to practice these skills.

The nation’s libraries reach and serve individuals of all ages, income levels, and ethnicities. They serve as information hubs, conveners, and collaborators within their educational and community contexts. They provide venues in which patrons and students can engage with, discuss, share, remix, and create information, going far beyond access to research and materials.

Librarians work in collaboration with educators across the preschool to higher education continuum and in the public realm in wide-ranging and significant ways to provide digital literacy instruction to their communities.

## Digital Literacy in the Current Public Policy Context

Twenty-first century digital literacy skills are basic to classroom performance and workforce readiness, as well as full participation in civic life. More than 80 percent of Fortune 500 companies post their job openings online only and require online applications. Fifty percent of today's jobs require some technology skills, and this percentage is expected to grow to 77 percent in the next decade. Moreover, government offices at all levels are increasingly providing opportunities for the public to communicate and interact with government officials via the Internet, and individuals who are not digitally literate can be excluded from these discussions. And as government services and information migrate online, the ability to successfully navigate often complex websites and online systems determines the ability to apply for unemployment benefits, schedule a meeting with immigration officials, or download tax forms.<sup>7</sup> Additionally, civic and political participation increases when it includes online activity. For example, individuals who use social media for such participation are 96 percent more likely to take part in offline civic activities and 67 percent more likely to contact public officials.<sup>8</sup>

A scan of policy documents, library resources, scholarly articles, blogs, and funding initiatives identified three main policy dialogues taking place around digital literacy—on digital inclusion, education, and the workforce.

### The Digital Skills Gap: Perpetuating the Digital Divide

From the perspective of highly connected, digitally literate individuals, adding digital components to everyday tasks—such as moving government forms or job applications online—can appear to be an easy and efficient way to improve traditional paper-based bureaucratic processes. Yet for the more than one-third of the U.S. population without regular Internet access or basic digital literacy skills, this shift often poses an overwhelming challenge that makes it impossible to take advantage of the resources and opportunities available online. In fact, the lack of digital literacy skills is a leading barrier to the adoption of broadband service at home.<sup>9</sup>

Not surprisingly, the percentage of individuals without a home Internet connection is highest for those living in traditionally underserved urban and rural communities. These individuals may be further challenged by lower incomes, less formal education, and other barriers to accessing digital technologies. According to *Digital Differences*, a 2012 report from the Pew Internet & American Life Project, “Senior citizens, those who prefer to take our surveys in Spanish rather than English, adults with less than a high school education, and those living in households earning less than \$30,000 per year are the least likely adults to have Internet access.”<sup>10</sup> Furthermore, of adults living with disabilities, 54 percent (compared with 81 percent of adults not living with disabilities) report being online.<sup>11</sup> School-age children without a regular

Internet connection have their own set of challenges. With many schools shifting to online-based courseware and Internet-based textbooks, a lack of home Internet access has a potentially detrimental effect on educational attainment. Such children may be unable to complete assignments requiring Internet resources, access online homework assistance, or participate in online cooperative educational activities.

From a policy perspective, the digital inclusion dialogue has evolved in three basic stages since the mid-1990s:

1. recognition of the need to make access to information and communication technologies<sup>12</sup> available to all;
2. recognition of the need for the development of basic technical skills related to these technologies; and
3. recognition of the need for the development of higher-level cognitive skills related to these technologies.<sup>13</sup>

These stages influence the current perspective on how to ameliorate the societal costs of digital exclusion and help focus policies on tangible outcomes. *Who's Responsible for the Digital Divide? Public Perceptions and Policy Implications*, a 2011 study, suggests that how the issue is framed and discussed influences who is perceived as responsible for addressing it.<sup>14</sup> For example, is the digital divide, whereby people are disadvantaged socially and economically because of a lack of access to and ability to use digital technologies, the result primarily of a lack of access to those technologies or of differences in the skills needed to make use of them? Framing the issue in terms of access suggests that government and corporations should address it, while framing it in terms of digital literacy suggests that schools, libraries, and individuals are responsible.

Of interest, during the 2008 U.S. presidential campaign, the Democratic and Republican candidates used both of these perspectives in discussing digital inclusion.<sup>15</sup> Across the political spectrum, then, both access and skills appear to have arrived on the policy agenda. From a policy point of view, this shift to a more comprehensive approach to addressing the causes and impacts of the lack of digital literacy skills is critical. If the obstacles to supporting a digitally literate society are to be overcome, access and the skills needed to benefit from it must occur in tandem. In *Digital and Media Literacy: A Plan of Action*, Renee Hobbs cautions against conflating “access to technology with the skillful use of it.”<sup>16</sup> Hobbs warns that educators and decision makers often equate having a set of technology-based tools at hand with providing students and the public with digital literacy curriculum and training. She notes, “Generally, neither children nor adults acquire critical thinking skills about mass media, popular culture or digital media just by using technology tools themselves....One thing is certain: simply buying computers for schools [and libraries] does not necessarily lead to digital and media literacy education.”<sup>17</sup>

In the context of renewed interest in digital inclusion as a necessary part of closing the broadband adoption gap, the National Broadband Plan calls on the Institute of Museum and

Library Services (IMLS) to develop guidelines for public access to broadband technologies in order to encourage their use. IMLS, together with the University of Washington and the International City/County Management Association, consulted with hundreds of community members and experts to identify action steps and a framework for building digital communities. The result was *Building Digital Communities: A Framework for Action*, published in March 2012.<sup>18</sup> The report specifically defines digital inclusion in communities to mean that:

- “All members understand the benefits of advanced information and communication technologies.
- All members have equitable and affordable access to high-speed Internet-connected devices and online content.
- All members can take advantage of the educational, economic, and social opportunities available through these technologies.”

Digital literacy is one of seven foundational principles that make up “the basic requirements for creating a digitally inclusive community.”<sup>19</sup>

Both the FCC and the Department of Commerce’s National Telecommunications and Information Administration (NTIA) also initiated efforts in 2011 to support digital literacy.<sup>20</sup> In collaboration with ten other federal agencies, NTIA launched the online portal DigitalLiteracy.gov to provide trainers in libraries and other community-based organizations with links to wide-ranging digital literacy resources and a community of practice to support their work. NTIA has invited organizations including ALA and its divisions to contribute and rate content so as to continually improve the portal.

In October 2011, the FCC initiated the public-private partnership Connect2Compete.<sup>21</sup> This initiative brings together low-cost computers and Internet access, micro-credit (i.e., very small loans for people who may otherwise have no credit history to secure a traditional loan), educational and workforce-related digital content, and digital literacy resources. The initiative is targeted at families with at least one school-age child enrolled for free lunch through the National School Lunch Program. A public website will provide a locator tool to help people find libraries and other community organizations that provide digital literacy instruction, as well as links to online training.

## Libraries Gear Up for Ad Council Campaign to Promote Digital Literacy

Digital literacy as a national focus will be further reinforced in 2013 as the Ad Council (with Connect2Compete) launches a 3-year campaign to promote the importance of digital literacy and motivate individuals and families to access free community resources and training. To gear up for this multimedia, multilingual campaign, IMLS funded two national efforts to improve public library capacity to meet the demand for digital literacy instruction. First, the Public Library Association is collaborating with the Chief Officers of State Library Agencies and ALA's Office for Information Technology Policy to develop an online collection of digital literacy resources that will be accessible to libraries, patrons, and other community-based organizations. In addition to user-directed resources, activities include the development of training curricula in English and Spanish, technology trainer competencies, and handouts and assessment of patron skills.<sup>1</sup> Second, Online Computer Library Center's (OCLC) WebJunction is working with state libraries in Illinois, Mississippi, and West Virginia; federal policy makers; and Connect2Compete to help national digital literacy efforts work effectively with public libraries to plan for and deliver digital literacy training. The project is identifying model approaches for partnerships with libraries to meet public demand for such training.<sup>1</sup>

## Beyond the Basics: Digital Literacy in Education

While public libraries provide lifelong opportunities for on-demand instruction or extracurricular learning, advanced digital literacy skills—from research, to project creation, to creative expression—are an emerging and increasingly important instructional focus in formal teaching and learning settings. These skills are being applied in K-12 classrooms and after-school centers, and colleges and universities in support of a wide range of curricular subjects.

In the K-12 educational context, media and digital literacy has been linked to the development of standards and assessments, such as the Framework of the Partnership for 21st Century Learning; National Educational Technology Standards from the International Society for Technology in Education (ISTE); and, more recently, the Common Core State Standards.<sup>22</sup> Digital literacy efforts in schools also have been spurred by legislation. For example, the No Child Left Behind Act of 2001 and the related Enhancing Education Through Technology Act stipulate that all children must be technologically literate by the end of grade 8.<sup>23</sup> Of significance, this requirement is tied to a concern about the digital divide (and thus interlinked with communications policy)—that children from households that are not online are less likely to become digitally literate at home.

The American Association of School Librarians (AASL), a division of ALA, has undertaken alignment of its Standards for the 21st Century Learner, developed in 2007, with Common Core Standards related to English Language Arts, Reading Standards for Literacy, and Writing Standards for Literacy.<sup>24</sup> Similarly, the Association for College and Research Libraries (ACRL), also a division of ALA, has developed Information Literacy Competency Standards for

Higher Education.<sup>25</sup> These efforts support in-service librarians by providing context and guidance for the educational programs they provide to students.

In many schools today, librarians are key to creating opportunities for teachers' meaningful use of technology, as well as increasing teachers' capacity for integrating the use of technology tools into specific learning tasks and curriculum. These librarians are integral to the creation of digital media and content for both student and teacher use in and out of the classroom and school building. Forty-six percent of librarians are regularly training teachers not only in how to find high-quality digital resources online but also in how to evaluate the quality of those resources, and 44 percent have created a library portal of resources for teacher use.<sup>26</sup> School librarians are local experts on the appropriate stewardship of electronic information, modeling responsible use of both Creative Commons licensing and copyrighted digital file formats within the realm of educational fair use. School librarians likewise are well positioned to teach the ethical and responsible use of information and communication technologies, helping students create positive digital footprints for a world that is increasingly virtual. The AASL standards require that school librarians be able to adapt and design relevant learning experiences that engage students in authentic learning through the use of digital tools and resources.<sup>27</sup>

Public and private funders also are addressing digital literacy from an educational perspective. IMLS and the John D. and Catherine T. MacArthur Foundation have developed pilot projects and promising practices in after-school settings. Through its Digital Media and Learning initiative, the MacArthur Foundation seeks to “determine how digital media are changing the way young people learn, play, socialize and participate in civic life.” The Foundation is funding researchers to investigate this question, as well as to develop digital learning spaces in public libraries and other out-of-school spaces.<sup>28</sup> This funding includes up to \$100,000 allocated to the development of learning labs in museums and libraries across the United States.<sup>29</sup>

Participatory learning,<sup>30</sup> collaboration, and content creation continue to push the boundaries of digital literacy as social media and other interactive online platforms become more mainstream and essential in daily life. Additionally, the Bill & Melinda Gates Foundation and the MacArthur Foundation have funded a 3-year project that will create video games to engage students in learning and measure their success.<sup>31</sup> “Learning is changing and so must educational institutions in order to engage kids and ensure they are taught the participatory and creative skills that are needed to succeed in the 21st century,” said Connie Yowell, Director of Education at the MacArthur Foundation.<sup>32</sup> School librarians can take a lead role in integrating models from these initiatives into the school ecosystem.



## Digital Literacy and a Competitive Workforce

Workforce and economic development demands a digitally literate workforce. In fall 2011, FCC Chairman Julius Genachowski framed a new digital literacy and broadband adoption effort within the contexts of education and employment:

We need to ensure that all of our population has at least those skills required for participation in our digital economy. The data confirms the existence of this skills mismatch. In twelve large metropolitan areas, the ratio of job postings to unemployed people is one to one. These jobs aren't getting filled because too many job seekers don't have the right skills. The skills gap is a national problem that has left businesses without a crucial supply of skilled workers and left many Americans without the right skills to land the jobs of the 21st century.<sup>33</sup>

Public, school, and academic libraries make up an information ecosystem in which members of the community can receive individual assistance and formal training to improve their digital literacy skills throughout their lives. The library role in supporting workforce readiness is born out in the continued increase of patrons coming to the library for job-related purposes.

According to an IMLS study, 30 million library users reported going to the library for employment-related activities in a 12-month period.<sup>34</sup> Of these 30 million, 76 percent searched for jobs, and of these, 68 percent applied for a job or submitted a résumé, 33 percent secured an interview, and about 16 percent were eventually hired.<sup>35</sup> Forty-six percent went to the library to work on a résumé using the public access computers. Moreover, 64.1 percent of public libraries say providing services to job seekers is the most important service they offer to communities, while 30 percent cite providing information for economic development (e.g., starting a business or seeking business opportunities).<sup>36</sup>

This vital role of public libraries in connecting community members with needed resources and information was formally acknowledged in 2010 with a Training and Employment Notice from the Department of Labor to local workforce agencies. The agencies were encouraged to partner with public libraries to extend their career and employment services, known as One-Stop Career Centers, to job seekers and unemployed workers.<sup>37</sup> Among the highlighted benefits One-Stops receive from this partnership are longer library hours (beyond One-Stop office hours), better and more technological access and assistance, and the fact that parents can work on their job search while their children are engaged in productive activities in the library.

Libraries can capitalize on the current interest in digital literacy while at the same time educating stakeholders as to the broader concepts involved in becoming digitally literate for the long term. In this way, any initiative can have the desired sustainable impact instead of falling short when funding dries up or a new initiative takes its place. Today's public policy emphasis is

on workforce development and economic competitiveness. Even when the public policy focus changes, however, librarians will continue their long tradition of helping individuals master the literacies necessary to be active participants in society.

## Libraries on a Continuum

**Meet Grace.** From birth, her parents have made weekly visits to the public library. She starts with board books and picture books, but soon becomes interested in the games in the children's computing area, where she learns letters and numbers. At the library, Grace meets Nathaniel, whose grandmother started bringing him to lap-sit story hour after learning about library programs for infants at the pediatrician's office. His grandmother is now thinking about taking a library class in online scrapbooking the library has advertised. Leah, who comes to the library after school, is in kindergarten and proudly talks to other children using the library's computers about what she does in school. Leah's school-based digital literacy learning journey includes clicking, dragging, and opening files and web browsers. She uses drawing programs that improve her hand-eye coordination and plays games to practice numbers and ABCs. While Leah is at school, her father visits the library to use the business-related databases and attends a class to hone his computer office skills; her mother, a paralegal, regularly accesses legal records online via the portal established by her law firm's librarian.

As Grace's, Nathaniel's, and Leah's reading skills develop, classroom teachers and school librarians introduce research concepts, sharing age-appropriate resources that help the children search online, use online multimedia, and share research findings via a class wiki. As the children move through the grade levels, the librarians are able to measure their increasing technological fluency across content areas and collaborate with classroom teachers to design lessons, projects, and assessments to improve their literacy skills. With guidance from the team of her creative writing teacher and the school librarian, Grace forms an online creative writing community where teens post stories and poetry and upload artwork. She adds a Twitter feed and gets friends to promote her space with her hashtag.

In high school, Nathaniel joins the TV broadcast club in the school library and learns about a volunteer opportunity working with the local Boys and Girls Club to capture family histories in short audio podcasts. He works with a young boy to get his abuelito (granddad) to do an interview with him about growing up on the Texas-Mexico border. Nathaniel uses this experience for a college essay that he writes and submits online at the public library.

After school, Leah brings her laptop to use with the public library's wifi to do her homework and access interactive online tutoring. Her public librarian introduces her to the Library of Congress's Veterans History Project, which provides primary source testimony for her Vietnam War unit in U.S. History. Grace continues on to college, where she learns from academic librarians how to use increasingly complex databases and data sets and how to synthesize, organize, and share her findings. She gains work experience volunteering at the local public library as a digital literacy coach, helping teens create online peer-sharing communities that include personal stories remixed with Creative Commons-licensed images and music clips.

A few years out of college, Nathaniel decides to start an online community news blog created by and for young people. He plans to make it available in both Spanish and English. He enrolls in classes at the public library to learn how to use online databases for help with writing grants and using social media to build support from local businesses and philanthropic foundations. As Leah begins a family, her children regularly visit the public library—both the physical and virtual branches; at the latter, YouTube-based storytimes are a popular family activity.

Libraries of different types may play a role throughout a person’s life in the ongoing development of digital literacy skills. Although the experiences of Leah, Grace, and Nathaniel are somewhat idealized, they represent the potential literacy contributions provided by consistent and seamless access to a variety of libraries across the lifespan. To strengthen this continuum in their communities, different types of libraries—school, academic, and public—can identify gaps or overlaps in services, working together to provide different types of digital literacy links that build on each other over the course of an individual’s lifetime and create a powerful network of information agencies to support personal, academic, and professional growth. This section looks more closely at the work under way in school, academic, and public libraries, highlighting some key issues and opportunities.

## School Libraries

School libraries always have been interdisciplinary spaces deeply connected to the curriculum, instrumental in developing students’ research and information literacy skills, and committed to creating an environment of free reading that supports lifelong learning and curiosity. These traditional roles and strengths are increasingly critical as society faces a deluge of digital information, and the lines between content user and content creator are blurred and even actively deconstructed.

### The Central Role of School Librarians in Student Learning

With the increase in mobile technology and dispersed information sources, the library and librarian are less limited to a single physical space and must maintain a strong presence across classrooms and through student social networks that enable learning outside classroom walls. A “connected” educational environment offers significant opportunity for partnering with teachers in curriculum development, lesson planning, and inquiry-based learning that is interactive and iterative. Moreover, collaboration and sharing enable valuable reuses and partnerships. For instance, a library web page’s online module on Shakespeare might be developed for multidisciplinary use, benefiting English, world history, and theater classes and activities.

Numerous studies have shown that the presence of a library and librarians in K-12 schools, in general, correlates with better student performance, including meeting educational

standards. The International Association of School Librarianship prepared a list of resources that answer the question, “Do school libraries make a difference?”<sup>38</sup> For example, a year-long project led by the Education Law Center, the Health Sciences Library Consortium, and the Pennsylvania School Librarians Association found that:

Students who have access to a full-time, certified librarian scored higher on the PSSA [Pennsylvania System of School Assessment] Reading Test than those students who do not have such access. This finding is true for all students, regardless of their socioeconomic, racial/ethnic, and/or disability status...Considering all students, those students with access to a full-time, certified librarian are almost three times as likely to have “Advanced” scores on the PSSA Writing Test as those students without access to a full-time, certified librarian.<sup>39</sup>

Because U.S. schools are under increasing pressure to meet standards, demonstrating the school library’s role in supporting student achievement has been an ongoing advocacy strategy. In relation to digital literacy, for example, technology provides important opportunities for school librarians to contribute to the mission of a school and impact student achievement. Using standards-based techniques, a collaborative teaching environment enriched through creative integration of technology tools takes learning beyond standardized tests and enables learning that embraces digital spaces, content, and resources and emphasizes that the process of learning is as important as an end product. An increasing focus on technology-enabled participatory learning also leverages the orientation of today’s and tomorrow’s students, for whom a digital environment is expected.

### **School Libraries at the Cutting Edge**

There are many examples of digitally innovative school libraries, such as those recognized with the National School Library Media Program of the Year award. In 2011, Henrico County (Virginia) Public Schools was recognized, in part, for its collaboration around Henrico21, which was designed to support effective instruction geared toward developing twenty-first century learners. In this effort, school librarians partnered with instructional technology resource teachers, administrators, and other school leaders to develop a rubric focused on the goals of student-driven inquiry, research, creativity, sharing, and student growth. According to School Superintendent Patrick Russo, “Our school librarians are a critical component of Henrico21. Together with the staff at each school, school librarians serve as powerful leaders who are responsive to the needs of the learning community.”<sup>40</sup>

The New Canaan High School Library in Connecticut, recently recognized for its innovative integration of technology into its curriculum, exemplifies several key traits of a rich school library program in which digital literacy skills are taught seamlessly. Technologies are incorporated into curriculum and activities such that the technologies are a natural tool for

achieving an outcome rather than the focus of the lesson.<sup>41</sup> The library's Participatory Platforms for Learning program strives to cultivate curiosity throughout the learning community and to encourage experimentation with new tools for content creation, publication, and participation. The program includes using the full complement of Google applications, advocating a culture of intellectual freedom, using Twitter for research on current events, and using Facebook groups for students to record their research process and provide feedback to others in the group. The program meshes learning and the real world to teach students digital citizenship by encouraging them to become responsible information consumers, creators, and contributors in the public realm.

The Unquiet Library at the Creekview High School Media Center in Canton, Georgia, offers more examples. In fall 2009 and spring 2010, a class of 10th-grade English students explored the uses of social media and cloud computing for communication and educational purposes; learned to identify and utilize authoritative information sources; and cultivated presentation styles designed to engage a twenty-first century, technology-savvy audience. Students participated in "literature circles" and contributed to blogs and wikis to share their subsequent reactions, reflections, and research on the semesters' subject content—issues in Africa and issues facing American military veterans. While the class structure included such traditional educational assignments as a research paper, students were encouraged to seek out and utilize tools for collaborative learning, such as Netvibes information portals, learning dashboards, and Evernote social bookmarking.

Students learned they have the opportunity to take personal responsibility for their education in new and exciting ways. One student praised the course subject matter, as well as its unique integration with cutting-edge technologies: "I actually learned about issues in the world, and I discovered a new way to learn that will definitely benefit me in the long run as technology continues to advance."<sup>42</sup>

### **School Librarians as Professional Development Leaders**

AASL describes the role of school librarians as professional development leaders who increase the digital and information literacy capacities of other educators. This role has grown in importance, with teachers reporting that they need help in responding to the pressure to integrate technology into the classroom and assess work products demonstrating students' digital skills. To ensure that school librarians are prepared for this role, AASL created the Standards for Initial Preparation of School Librarians, which have been approved by the Specialty Areas Studies Board of the National Accreditation of Teacher Education. Two-thirds of school librarians (67 percent) regularly participate in professional learning communities with their teachers. They also support teachers' use of technology in many ways, including creating collections of appropriate online resources for use in the classroom (65 percent); locating digital content such as videos, animations, and podcasts to support instruction (51 percent); and evaluating software for classroom use (40 percent).<sup>43</sup> Librarians also continue to take responsibility for their own digital

learning and are creating a culture of learning among their peers. All of these contributions translate to a rich and meaningful learning environment for students.

### **Academic Libraries**

The role of the academic library in the higher education ecosystem reflects the important relationship between the classroom professors, the curriculum, and the librarians in contributing to students' digital literacy. That is, the degree to which students take advantage of library resources—and the digital literacy skills they can gain by working with librarians—is influenced by the extent to which their official coursework or classroom time provides a link.

### **Digital Literacy through Information Literacy**

Although academic libraries are more focused on information literacy than digital literacy, these two twenty-first century literacies are closely linked: information literacy requires digital literacy to access appropriate online research sources, and information literacy gives further context to the evaluation skills developed by digital literacy. ACRL's Information Literacy Competency Standards for Higher Education are often cited as a key resource on the role of and criteria for information literacy.<sup>44</sup> Furthermore, students learn many skills and research methods beyond what they learn in or about the library; thus, the development of information literacy is gained partly inside but also outside of the library.

### **Collaborative Partnerships**

Information literacy initiatives often are a campus-wide effort. Librarians partner with professors, student affairs professionals, and media services staff, among others, to advance both the library and campus missions. Yet despite the potential of academic libraries to contribute to information literacy, perhaps the greatest challenge for academic librarians is that college students make much less use of librarians' expertise than they could. A five-campus, 2-year ethnographic study investigating how students perceive and use their campus libraries revealed that "students rarely ask librarians for help, even when they need it."<sup>45</sup> The study findings detail just how underdeveloped students' skills are when it comes to applying the digital fluency they show in nonacademic settings (e.g., on Facebook, in texting, in sharing videos with friends) in traditionally academic settings and with academic resources.

Many campuses are recognizing the importance of redefining what digital literacy means in the realm of higher education. They are taking an unvarnished, pragmatic look at students' struggles to engage fully with digital resources and communities in academic settings and at what information skills students need for the workplace. Librarians are applying these findings by striving to work closely with university administrators and professors to integrate information literacy skills into the student learning process. At the University of Tennessee in Chattanooga, for example, librarians helped write the basic English curriculum, ensuring that the standard course, reaching 78 percent of freshmen, was aligned with ACRL information literacy standards.

Today, “students simply cannot pass either semester of freshman composition without meeting a certain minimal threshold of information literacy in accordance with ACRL standards 1 through 4.”<sup>46</sup>

### **Activity Level in the Field**

Instructional efforts at academic libraries take many forms, from face-to-face and web-based instructional offerings to carefully crafted pathfinders and guides. The libraries have appointments devoted to instruction and information literacy, and each year ACRL’s Institute for Information Literacy Immersion Program trains academic librarians in the development, delivery, assessment, and management of information literacy.<sup>47</sup> Today’s information literacy efforts reflect an extensive level of activity in the field. According to a recent ALA report on *Trends in Academic Libraries*, for example, “nearly half (46.6 percent) of all academic libraries reporting had a definition for information literacy or an information literate student, increasing about 18.2 percent in 2008 from 2004.”<sup>48</sup> Additionally, there was “a 13 percent increase in 2008 from 2004 of all academic libraries reporting having incorporated information literacy into their institutional missions.”<sup>49</sup> Growth also has occurred in the overall number of instruction sessions and in the number of learners reached by the instruction.

In addition to course-integrated offerings and guides, some institutions offer for-credit information literacy courses. Iowa State University’s Library 160 course is by far one of the oldest information literacy courses in the United States. In its nearly 100-year history, the course has undergone many curriculum transformations, from an introductory library session to now shaping its core outcomes according to ACRL’s Information Literacy Competency Standards for Higher Education. The required 1-credit hour course is structured with readings and quizzes that cover information needs, web resources and evaluation, library resources, scholarly and popular articles, how to work with the library’s databases, and academic integrity and plagiarism. In today’s digital environment, social responsibility in information use is more important than ever. Librarians instruct students in proper citation techniques and ethical retrieval methods. They help college students hone the critical and problem-solving skills needed to survive and thrive in a digital world. Such activities will prepare students for future academic success and set the stage for lifelong learning habits.

### **The Academic Librarian’s Toolkit**

Academic librarians are true innovators in the classroom, ever investigating interactive instructional methods and new modes of delivering instruction. Today’s classroom environment calls on librarians to meet students where they are, which may be beyond library walls. Librarians work to embed tools such as chat widgets into library databases and use multimedia guides such as LibGuides to enhance instruction sessions and assignments. They also create online tutorials and instructional videos; use learning management systems; and craft interactive, homegrown games for use by students to explore information literacy concepts. And by working with Web 2.0 technologies, they encourage students to gain confidence with exploring new

technologies while modeling appropriate, responsible use of them. In all of these efforts, librarians strive to make the learning experience as dynamic and engaging as possible.

### **Information Literacy Assessment Initiatives**

An extensive body of literature focused on information literacy explores, among many other aspects of the subject, how people experience and respond to the changing digital world. The University of Washington Information School's ongoing research project on Project Information Literacy is one example of a systematic and concentrated effort to document the state of competency in information literacy among undergraduate students across the United States and across all institution types, including public and private universities and colleges and community colleges.<sup>50</sup>

Many academic libraries today, in line with campus information literacy initiatives, have undertaken assessment of the impact of these initiatives on student learning and the effectiveness of instruction. Standardized testing options are available with which to assess instructional programs and measure the information literacy abilities of students. The Standardized Assessment of Information Literacy Skills (SAILS) and the iSkills Assessment from the Educational Testing Service are two tools used for this purpose. Additionally, libraries may use a self-reporting assessment tool such as LibQUAL+ to collect both quantitative and qualitative information on instructional programs and information literacy efforts. The National Survey of Student Engagement (NSSE) is another assessment tool that measures the quality of colleges and universities in relationship to the effort students put into learning, how institutions make resources available, and how they organize curriculum. Currently, an information literacy module is being developed for NSSE.<sup>51</sup>

These assessments enable librarians to remain responsive to user needs. In turn, librarians can confidently communicate with campus administrators and legislators, showing them data that support the impact of the library on students' information literacy development.

### **Public Libraries**

To fill the gap for library users who lack access to the Internet at home or need assistance in using it, public libraries offer resources, technology, and services to people of all ages and abilities across the country.

### **On the Front Lines of Digital Inclusion and Lifelong Learning**

Fully 99 percent of public libraries offer public Internet access, and more than 90 percent report providing digital literacy services such as formal technology classes, online tutorials, and one-on-one help.<sup>52</sup> As noted earlier, in addition to providing technology access and general training, public librarians help children, adults, and senior citizens with topic-specific tasks that increasingly require digital literacy, such as applying for jobs, accessing government resources, and completing school assignments.



More broadly, as illustrated in the vignette at the beginning of this section, public libraries often are the introductory point for what becomes lifelong literacy—from lapsit and storytime programs to first reading experiences—as well as the place where many adult learners turn to build their literacy skills. In 2003, the National Assessment of Adult Literacy (NAAL) found that 90 million American adults (aged 16 or older) read at basic or below basic levels. These adults lack the literacy skills necessary to read and comprehend the information in complex documents. As discussed earlier, these traditional literacy skills—developed, encouraged, and supported by public libraries—are necessary to support meaningful engagement with online information as well. Recognizing the signs of people with literacy issues (digital or otherwise) can help libraries tailor literacy instruction—including digital literacy—to meet their needs.

Over the past several years, public libraries have documented increased demand for technology access and digital literacy instruction. For instance, a 2012 report found that 60 percent of libraries had experienced increased use of their public access computers and wireless networks. A majority of libraries also reported increased or level use of computer training classes.<sup>53</sup> In 2009, 52 million people were helped with using computers by a librarian or library volunteer; 16 million participated in library computer classes.<sup>54</sup>

While public libraries certainly provide an economic benefit in enabling individuals across the United States to obtain support with technological tasks and build digital skills, this role creates a demand for increased library staff and infrastructure. The demand for Internet access and digital task-related assistance is evidenced by lines for computer access, requiring time limits on computer usage; by stressed network infrastructure; and by ever-increasing requests for library staff to provide sophisticated technological help. Downturns in the economy and associated cuts in funding, staffing, service models, and hours have made providing a range of digital services challenging for most institutions.

As businesses, government offices, and schools move services online, providing access to these online services often falls to public libraries, and digital literacy (or its lack) is one of the increased “costs” libraries bear.<sup>55</sup> There is some recognition of this problem at the federal level. In the National Broadband Plan, the FCC states, “As government services increasingly go online, libraries shoulder responsibility for helping people learn how to use these online services,” and recommends the creation of guidelines to assist federal agencies in developing e-government services that “take into account the role of public libraries and CBOs [community-based organizations] as delivery points.”<sup>56</sup>

This scenario begs the question: If government, corporations, schools, and others are, in part, creating issues by moving services online, what is their obligation to provide resources to help people get online or to support the agencies, such as public libraries, that can assist in obtaining those resources and the associated skills? Moreover, what are the social and economic costs of ignoring this situation?

A study sponsored by the U.K. government suggests that there is a strong economic case for digital inclusion. That is, when people are left offline because of access, skills, usability, or

other issues, they suffer economically. The U.K. study estimates the total potential economic benefit from getting everyone in the country online to be in excess of £22 billion. In the United States, a 2009 study found that “the net benefits to U.S. households from home broadband relative to no home Internet are in the range of \$32 billion per year.”<sup>57</sup> Public libraries are critical front-line points of access and digital literacy training, whether as providers of formal classes, one-on-one support, or open lab time to practice skills. Sustainable, long-term investments in libraries will therefore lead to increased digital and economic inclusion and civic engagement.

## Opportunities to Support Digital Literacy

Public libraries, often through the leadership of state library agencies, are creating new opportunities to support digital literacy, spurred by the American Recovery and Reinvestment Act (ARRA). The resulting projects under the Broadband Technology Opportunities Program have initiated new community partnerships for library grant recipients, as well as for libraries included as partners in other projects within the program.<sup>58</sup> Many of the projects are centered on workforce development and include a digital literacy component that encompasses online job search and application workshops, professional email etiquette, and computer office applications.

While the Broadband Technology Opportunities Program represents a significant infusion of resources for public libraries, other libraries have developed programs through community partnerships and other funding sources. In St. Paul, Minnesota, for example, the public library branches offer formal training that includes basic digital literacy, job search skills, and small business development. Formal classes are supplemented with a variety of one-on-one support, including open computer lab sessions staffed by a librarian, walk-in computer help staffed by a technology education volunteer, computer classes for older adults in partnership with the

### NJ Works

According to a New Jersey State Library representative, “NJ Works’ is a statewide project that was made possible by a federal BTOP [Broadband Technology Opportunities Program] grant for Public Computing Centers. Although the New Jersey State Library handled the increased broadband access, additional computers and online electronic resources on our own, when it came to training, partnerships really paid off!

“Our grant called for 80 training sessions for staff and 800 training sessions for the public on how to use technology to write résumés, search online resources and fill out job applications. The State Library partnered with the New Jersey Council of County Colleges on this massive endeavor. This group was a perfect fit with our project, as their campuses are located throughout the state so trainers did not have to travel long distances for the training sessions. Also, their instructors are already trainers so did not need this additional skill set before starting the classes. The Council also had done training in the past for the Department of Labor and Workforce Development so they were keenly aware of the need to keep outputs and, when possible, outcomes from their

training. Finally, one of their trainers who also is a librarian, wrote a model training module that all trainers were able to use, ensuring parity of training statewide.

“Prior to the official grant, the State Library also partnered with the New Jersey Department of Labor and Workforce Development and the New Jersey Library Association to hold classes in libraries across the state for library staff to enable them to assist library customers with filing out online unemployment applications. With no more than two One Stop Centers per county in New Jersey this greatly relieved the backlog of applications the Department was dealing with.

Along with ‘NJ Works’ the State Library has recently launched ‘NJ Grows Biz,’ digital literacy for small businesses and entrepreneurs. The State Library has licensed databases that are complementary to the information being offered by our state’s Business Action Center and Small Business Development Centers and a business outreach specialist travels throughout the state bringing awareness of these resources to every community.”<sup>1</sup>

Community Education Senior Program, adult learning labs for job skills, classes for teens run by a “teen tech crew,” and computer basics practice groups for patrons needing extra time to practice. In another example, the St. Paul library system hires native speakers in one of six languages—Hmong, Spanish, Karen, Somali, and two Ethiopian dialects—to provide computer training through a “mobile workplace.” The trainers receive a small stipend and spend about 10 hours per week in bringing the training to community centers where the different populations already are engaged in activities. The mobile workplace consists of a car with ten laptops. The library reports that these on-site sessions are fully subscribed and that with additional funds, the sessions could easily be increased and filled.<sup>59</sup>

Many public libraries are reimagining services and space, as evidenced by the growing number that are engaged in creating programs modeled on digital learning labs, such as Chicago Public Library’s YOUmedia Network. YOUmedia has created a toolkit that provides information and resources for libraries and other entities to use in exploring options for creating their own interactive, connected learning spaces.<sup>60</sup> Libraries also are reaching beyond their own walls to extend farther into the broader community. The Philadelphia Free Library is building on its initial Broadband Technology Opportunities Program investment from the Freedom Rings Partnership to create “Hot Spots” with additional funding from the John S. and James L. Knight Foundation.<sup>61</sup> These Hot Spots, located throughout North, West, and South Philadelphia, bring Internet connectivity and technology skills training to Philadelphians who lack convenient computer access. In addition to providing open computer time, they are staffed by trained computer assistants who offer patrons guided instruction. Each Hot Spot includes computers, a printer, and all necessary broadband equipment, as well as a reference collection of Free Library materials.<sup>62</sup> The library also is seeking community partners to connect with its Techmobile, a 25-foot vehicle outfitted for digital literacy training and outreach.

## Summary: Challenges and Opportunities

Libraries of different types—school, academic, and public—are influenced by similar trends, such as downturns in the economy and associated funding cuts and the continued development of new information and communication technologies. This report has described in detail some of the challenges related to digital literacy faced by all libraries include the following:

- The role libraries play in digital literacy is not always recognized and valued, even within institutions or communities in which libraries are embedded—an issue of invisibility.
- Libraries are facing budget cuts, staff cuts, and even closures, which impact their ability to support digital literacy.
- The profession needs to continue to ensure that new librarians are prepared for leading digital literacy programs and that those in service receive training in this role.
- Some libraries lack sufficient staff and/or their staff lack the subject area or technical expertise needed to adequately support the digital literacy needs of users.

Future work should identify strategies on how to address these and other possible challenges.

Overall, libraries have a sizable reach in terms of supporting—or having the potential to support—the digital literacy needs of many different populations. Libraries, situated in communities and schools, reach learners of all ages, from the very young; to elementary school, high school, college, and university students; to adult learners and older adults. They also support the digital literacy of specific groups, such as job seekers or non-English speakers.

Libraries can capitalize on the current interest in digital literacy while also educating stakeholders as to the broader concepts involved in becoming truly digitally literate over a lifetime. Helping people, regardless of their life stage, develop the ability to master the technical skills required today while building on their cognitive capacity creates learners who can both adapt to current trends and negotiate future challenges. This is the long-term benefit of including the library community in national, state, and local digital inclusion initiatives.

## Appendix

### Digital Literacy Task Force Membership & ALA Affiliations

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The Digital Literacy Task Force worked diligently to supply specific examples, deeper discussion, and supporting resources where needed. The task force members worked hard as well to bring to the report the voices of the organizations they represent. They also provided a real-world perspective that can be lost in policy work. The OITP staff is very appreciative of their leadership.

Finally, we wish to acknowledge the ALA staff who worked with us throughout the process to connect us to librarians who are leaders in their communities and to provide valuable resources, and who represent what can be achieved by dedicated librarians and their staff. Consultants Amelia Bryne and Rona Briere provided valuable research and editorial assistance.

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<sup>1</sup>In early 2009, Congress directed the Federal Communications Commission (FCC) to develop what became the National Broadband Plan (NBP), which would “ensure every American has access to broadband

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capability.” Congress required that the NBP provide “a detailed strategy for achieving affordability and maximizing use of broadband to advance consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, employee training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes.” The executive summary of the NBP is available at <http://www.broadband.gov/plan/executive-summary/>. The section that includes digital literacy is available at <http://www.broadband.gov/plan/9-adoption-and-utilization/#s9-3>. To see ALA’s work related to the NBP or Broadband Technology Opportunities Program (BTOP), see <http://www.districtdispatch.org/?s=national+broadband+plan> and <http://www.districtdispatch.org/?s=BTOP>. Also in 2009, Congress authorized the American Recovery and Reinvestment Act (ARRA), which provided the Department of Commerce’s National Telecommunications and Information Administration (NTIA) with \$4.7 billion. NTIA administered these funds through the BTOP in the form of grants. The Department of Agriculture’s Rural Utilities Service (RUS) received \$2.5 billion, for a total of \$7.2 billion allocated for programs related to expanding broadband Internet and making it accessible and affordable across the country. BTOP projects support the deployment of broadband infrastructure, enhance and expand public computing centers, encourage sustainable broadband adoption, and develop and maintain a national broadband map. Libraries were direct recipients of grant funds, primarily in the public computing center category, but also in the sustainable broadband adoption category. Libraries were also included in a number of infrastructure projects. For more information, see <http://www2.ntia.doc.gov/about> and <http://www.broadbandusa.gov/BIPportal/index.htm>.

<sup>2</sup>*Connecting America: The National Broadband Plan* (2010). Federal Communications Commission. Available at <http://download.broadband.gov/plan/national-broadband-plan.pdf> (accessed November 19, 2012).

<sup>3</sup>From the Common Core State Standards Initiative website: “Just as media and technology are integrated in school and life in the twenty-first century, skills related to media use (both critical analysis and production of media) are integrated throughout the standards.” Available at <http://www.corestandards.org/about-the-standards> (accessed September 17, 2012).

<sup>4</sup>As defined by the Institute of Museum and Library Services in its 2012 report *Building Digital Communities*, “Digital inclusion is the ability of individuals and groups to access and use information and communication technologies. Digital inclusion encompasses not only access to the Internet but also the availability of hardware and software; relevant content and services; and training for the digital literacy skills required for effective use of information and communication technologies.” The full report is available at <http://www.ims.gov/assets/1/AssetManager/BuildingDigitalCommunities.pdf> (accessed January 13, 2013).

<sup>5</sup>“FCC Chairman Announces Jobs-Focused Digital Literacy Partnership Between Connect2Compete and the 2,800 American Job Centers” (July 23, 2012). Blogpost. Available at <http://www.fcc.gov/blog/fcc-chairman-announces-jobs-focused-digital-literacy-partnership-between-connect2compete-and-28> (accessed September 17, 2012).

<sup>6</sup>*ALA Fact Sheet 1: Number of Libraries in the United States* (updated December 2011). Available at <http://www.ala.org/tools/libfactsheets/alalibraryfactsheet01> (accessed September 13, 2012).

<sup>7</sup>Available at <http://www.plinternetsurvey.org/analysis/public-libraries-and-e-government> (accessed January 3, 2013).

<sup>8</sup>Rainie, L. (2011). *Social Media and Civic Life*. Available at <http://pewinternet.org/Presentations/2011/Oct/NASCIO.aspx> (accessed September 13, 2012).

<sup>9</sup>Horrigan, J. B. (February 2012). *Broadband Adoption and Use in America: OBI Working Paper Series No. 1*. Available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-296442A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf) (accessed September 17, 2012).

<sup>10</sup>Zickuhr, K. and A. Smith. (April 2012). *Digital Differences*. Pew Internet & American Life Project. Available at <http://pewinternet.org/Reports/2012/Digital-differences.aspx> (accessed September 17, 2012).

<sup>11</sup>*Ibid.*

<sup>12</sup>Information and communication technology generally refers to the technologies necessary to access and use telecommunications products, platforms, and services. Today these technologies include the Internet, wireless networks, and mobile devices, among others. See more at <http://www.techterms.com/definition/ict> (accessed November 19, 2012).

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<sup>13</sup>This is not to say that all policy makers are now at “stage 3.” Educational Testing Services (ETS) (2007). *Digital Transformation: A Framework for ICT Literacy*. A Report of the International ICT Literacy Panel.

<sup>14</sup>Available at <http://www.sri.cornell.edu/sri/files/EpsteinNisbetGillespie-WhoIsResponsibleForTheDigitalDivide-2011.pdf> (accessed September 8, 2012).

<sup>15</sup>Ibid, p. 102.

<sup>16</sup>Hobbs, R. (2010). *Digital and Media Literacy: A Plan of Action*. The Aspen Institute Communications and Society Program. Washington, D.C., p. 29. Available at [http://www.knightcomm.org/wp-content/uploads/2010/12/Digital\\_and\\_Media\\_Literacy\\_A\\_Plan\\_of\\_Action.pdf](http://www.knightcomm.org/wp-content/uploads/2010/12/Digital_and_Media_Literacy_A_Plan_of_Action.pdf) (accessed September 8, 2012).

<sup>17</sup>Ibid.

<sup>18</sup>Institute of Museum and Library Services, University of Washington, International City/County Management Association (January 2012). *Building Digital Communities: A Framework for Action*. Washington, DC: Institute of Museum and Library Services. Available at [http://www.imls.gov/assets/1/AssetManager/BuildingDigitalCommunities\\_Framework.pdf](http://www.imls.gov/assets/1/AssetManager/BuildingDigitalCommunities_Framework.pdf) (accessed September 17, 2012).

<sup>19</sup>Ibid, p. 1.

<sup>20</sup>The National Telecommunications and Information Administration (NTIA) is part of the U.S. Department of Commerce and is an Executive Branch agency that is responsible for advising the President on telecommunications and information policy issues. NTIA’s current focus is on expanding broadband Internet access and adoption across the country. View the website at <http://www.ntia.doc.gov/> (accessed January 3, 2013).

<sup>21</sup>For more information, see the official website at <http://www.connect2compete.org/> (accessed January 3, 2013).

<sup>22</sup>See <http://www.p21.org/index.php> (accessed September 17, 2012) for a discussion of the Partnership for 21<sup>st</sup> Century Skills. See <http://www.iste.org/standards> for a discussion of the ISTE standards. See <http://www.corestandards.org/> (accessed September 17, 2012) for a discussion of the Common Core State Standards Initiative.

<sup>23</sup>U.S. Department of Education. *Enhancing Education Through Technology Act of 2001*, Section 2402, “Purposes and Goals.” Available at <http://www2.ed.gov/policy/elsec/leg/esea02/pg34.html> (accessed September 17, 2012).

<sup>24</sup>Available at <http://www.ala.org/aasl/guidelinesandstandards/commoncorecrosswalk> (accessed September 8, 2012).

<sup>25</sup>Available at <http://www.ala.org/acrl/standards/informationliteracycompetency> (accessed September 8, 2012).

<sup>26</sup>Project Tomorrow (May 2012) “Personalizing the Classroom Experience—Teachers, Librarians and Administrators Connect the Dots with Digital Learning.” Available at [http://www.tomorrow.org/speakup/pdfs/SU11\\_PersonalizedLearning\\_Educators.pdf](http://www.tomorrow.org/speakup/pdfs/SU11_PersonalizedLearning_Educators.pdf) (accessed September 17, 2012).

<sup>27</sup>*2010 ALA/AASL Standards for Initial Preparation of School Librarians*. Standard 3.3: Information Technology. Available at

[http://www.ala.org/aasl/sites/ala.org.aasl/files/content/aasleducation/schoollibrary/2010\\_standards\\_with\\_rubrics\\_and\\_statements\\_1-31-11.pdf](http://www.ala.org/aasl/sites/ala.org.aasl/files/content/aasleducation/schoollibrary/2010_standards_with_rubrics_and_statements_1-31-11.pdf) (accessed October 30, 2012).

<sup>28</sup>The MacArthur Foundation recognized that the impact of digital media on young people has far-reaching consequences for learning institutions and therefore created a Digital Media and Learning initiative. The scope of this initiative ranges from research, to raising awareness, to grant making, to influence, to demonstration of new and successful approaches to teaching and learning. Overall, the Foundation plans to shape a policy environment that supports such learning. For more information, see <http://www.macfound.org/programs/learning/strategy/> (accessed September 8, 2012).

<sup>29</sup>For more information on the libraries and museums that have received funding for the development of a learning lab, see the IMLS press release announcing the awards. Available at [http://www.imls.gov/national\\_competition\\_selects\\_12\\_libraries\\_and\\_museums\\_to\\_build\\_innovative\\_learning\\_labs\\_for\\_teens.aspx](http://www.imls.gov/national_competition_selects_12_libraries_and_museums_to_build_innovative_learning_labs_for_teens.aspx) (accessed September 8, 2012).

<sup>30</sup>Participatory learning, like digital literacy, is an evolving concept. The Consortium of School Networking (CoSN) has a short paper offering one definition. Available at



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<http://www.cosn.org/initiatives/participatorylearning/home/tabid/7112/default.aspx><http://www.cosn.org/Portals/7/docs/Web%202.0/Participatory%20Learning-Definition%20online.pdf> (accessed October 29, 2012).

<sup>31</sup>Available at <http://www.macfound.org/press/from-field/new-learning-lab-will-research-develop-games-engage-students-measure-learning/> (accessed September 8, 2012).

<sup>32</sup>Available at [http://www.macfound.org/media/article\\_pdfs/GLASS\\_LAB\\_PRESS\\_RELEASE\\_06\\_28\\_2012\\_2.pdf](http://www.macfound.org/media/article_pdfs/GLASS_LAB_PRESS_RELEASE_06_28_2012_2.pdf) (accessed September 8, 2012).

<sup>33</sup>Remarks of FCC Chairman Julius Genachowski at an event announcing a public-private partnership to address broadband adoption (October 12, 2011). Available at <http://www.fcc.gov/document/chairman-genachowski-broadband-adoption> (accessed September 17, 2012).

<sup>34</sup>Becker, S. et al. (2010). *Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries*. Washington, DC: Institute of Museum and Library Services. Available at <http://www.ims.gov/assets/1/AssetManager/OpportunityForAll.pdf> (accessed September 8, 2012).

<sup>35</sup>Ibid, p. 80.

<sup>36</sup>Bertot, J. C., A. McDermott, R. Lincoln, B. Real, and K. Peterson. (2012). *2011-2012 Public Library Funding and Technology Access Survey: Survey Findings and Results*. College Park, MD: Information Policy and Access Center, University of Maryland, College Park. Figure 15, p. 24. Available at <http://www.plinternetsurvey.org> (accessed January 3, 2013).

<sup>37</sup>Available at [http://www.ims.gov/department\\_of\\_labor\\_provides\\_guidance\\_to\\_workforce\\_agencies.aspx](http://www.ims.gov/department_of_labor_provides_guidance_to_workforce_agencies.aspx). For general information about the Department of Labor's One-Stop Career Center program, see [http://www.dol.gov/dol/topic/training/onestop.htm#.UJlj\\_W\\_A8Ww](http://www.dol.gov/dol/topic/training/onestop.htm#.UJlj_W_A8Ww) (accessed September 8, 2012).

<sup>38</sup>Available at <http://www.iasl-online.org/advocacy/make-a-difference.html> (accessed September 9, 2012).

<sup>39</sup>*Creating 21<sup>st</sup> Century Learners: A Report on Pennsylvania's Public School Libraries* (2012). Available at [http://lgdata.s3-website-us-east-1.amazonaws.com/docs/2788/580001/Creating21stCenturyLearners\\_LibraryDataReport.10.17.12.pdf](http://lgdata.s3-website-us-east-1.amazonaws.com/docs/2788/580001/Creating21stCenturyLearners_LibraryDataReport.10.17.12.pdf) (accessed October 31, 2012).

<sup>40</sup>"Henrico County Public Schools Named National School Library Program of the Year" (April 29, 2011), *American Libraries Magazine* press release. Available at <http://americanlibrariesmagazine.org/news/ala/henrico-county-public-schools-named-national-school-library-program-year> (accessed September 17, 2012).

<sup>41</sup>"ALA Recognizes Four Library Programs as Top Cutting-Edge Services in Third Annual Contest" (January 23, 2012). Blog post on *District Dispatch*, Washington, DC. Available at <http://www.districtdispatch.org/2012/01/ala-recognizes-four-library-programs-as-top-cutting-edge-services-in-third-annual-contest/> (accessed September 17, 2012).

<sup>42</sup>Available at <http://www.ala.org/offices/sites/ala.org.offices/files/content/oitp/cuttingedge/cuttingedge2011.pdf> (accessed January 3, 2013).

<sup>43</sup>Project Tomorrow (May 2012). "Personalizing the Classroom Experience." Available at [http://www.tomorrow.org/speakup/pdfs/SU11\\_PersonalizedLearning\\_Educators.pdf](http://www.tomorrow.org/speakup/pdfs/SU11_PersonalizedLearning_Educators.pdf) p3 (accessed September 17, 2012).

<sup>44</sup>Available at <http://www.ala.org/acrl/standards/informationliteracycompetency> (accessed January 3, 2013).

<sup>45</sup>Kolowich, S. *What Students don't Know* (August 22, 2011). Inside Higher ED. Available [http://www.insidehighered.com/news/2011/08/22/erial\\_study\\_of\\_student\\_research\\_habits\\_at\\_illinois\\_university\\_libraries\\_reveals\\_alarmingly\\_poor\\_information\\_literacy\\_and\\_skills](http://www.insidehighered.com/news/2011/08/22/erial_study_of_student_research_habits_at_illinois_university_libraries_reveals_alarmingly_poor_information_literacy_and_skills). (accessed January 15, 2013).

<sup>46</sup>*Information Literacy Competency Standards for Higher Education* (2000). American Library Association. Available at <http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/standards.pdf> (accessed November 19, 2012).

<sup>47</sup>For more information, see <http://www.ala.org/acrl/issues/infolit/professactivity/iil/welcome> (accessed November 19, 2012).

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<sup>48</sup>Davis, D. (2011). *Trends in Academic Libraries, 1998 to 2008*. American Library Association. Available <http://www.ala.org/research/sites/ala.org.research/files/content/librarystats/academic/ALS%209808%20comparison.pdf>, p. 42 (accessed January 15, 2013).

<sup>49</sup>Ibid p. 43.

<sup>50</sup>Project Information Literacy (last updated August 1, 2012). Available at <http://projectinfolit.org/> (accessed September 17, 2012).

<sup>51</sup>For more information about the National Survey of Student Engagement, see <http://nsse.iub.edu/html/about.cfm>. (accessed November 6, 2012).

<sup>52</sup>Hoffman, J., J. C. Bertot, and D. M. Davis (June 2012). *Libraries Connect Communities: Public Library Funding and Technology Access Study 2011-2012*. Digital supplement of *American Libraries* magazine. Available at <http://viewer.zmags.com/publication/4673a369.P6> (accessed September 17, 2012).

<sup>53</sup>Ibid.

<sup>54</sup>Available at <http://www.imls.gov/assets/1/AssetManager/OpportunityForAll.pdf> (accessed September 17, 2012), see p. 42 and 44.

<sup>55</sup>Dailey, D., A. Bryne, A. Powell, J. Karaganis, and J. Chung (2010). *Broadband Adoption in Low-Income Communities*. Social Science Research Council. For discussion of cost shifting generally, see [http://webarchive.ssrc.org/pdfs/Broadband\\_Adoption\\_v1.1.pdf](http://webarchive.ssrc.org/pdfs/Broadband_Adoption_v1.1.pdf) (accessed September 17, 2012), pp. 67-70.

<sup>56</sup>*National Broadband Plan*. Available at <http://download.broadband.gov/plan/national-broadband-plan.pdf> (accessed September 9, 2012); see p. 177.

<sup>57</sup>Dutz, M., J. Orszag, and R. Willig (2009). *The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households*. Commissioned by the Internet Innovation Alliance. Available at [http://internetinnovation.org/files/special-reports/CONSUMER\\_BENEFITS\\_OF\\_BROADBAND.pdf](http://internetinnovation.org/files/special-reports/CONSUMER_BENEFITS_OF_BROADBAND.pdf) (accessed November 6, 2012).

<sup>58</sup>See footnote 1 for an explanation of the ARRA and BTOP.

<sup>59</sup>Personal email communication with Marijke Visser, Office for Information Technology Policy, March 26, 2012.

<sup>60</sup>Available at <http://www.youmedia.org/toolkit> (accessed January 3, 2013).

<sup>61</sup>Free Library of Philadelphia. Available at <http://www.freelibrary.org/libserv/hotspots.htm> (accessed September 17, 2012).

<sup>62</sup>Available at <http://hotspots.freelibrary.wikispaces.net/About+Us> (accessed October 31, 2012).



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The Office for Information Technology Policy advocates for public policy that supports and encourages the efforts of libraries to ensure access to electronic information resources as a means of upholding the public's right to a free and open information society.