The Internet has become increasingly central to our daily lives (Johnson, Levine, Smith, & Smythe, 2009), transforming the ways we access, use, and exchange information. To fully participate in a globally networked society, every student needs to develop strategies for locating, comprehending, and responding to text in ways that exploit the potentials of information and communication technologies (ICTs) (Educational Testing Service [ETS], 2003; International Reading Association [IRA], 2009; National Council of Teachers of English [NCTE], 2007). Making sense of digital information requires skills and strategies that are complex, and in some cases unique, to online reading and writing contexts (Affl erbach & Cho, 2008; Coiro & Dobler, 2007; Transliteracies Project, 2006). Thus, students’ proficiencies in the new millennium cannot be determined solely on the basis of their literacy performance in non-digital contexts (Leu et al., 2005; O’Brien, 2006).

To date, existing assessments fail to measure the literacy skills, knowledge, and dispositions that are increasingly important for participation in a digital age (Assessment and Teaching of 21st Century Skills [ATC21S], 2009; IRA/NCTE, 2010). As a result, online literacy is not integrated into language arts standards and is rarely taught in schools (Hew & Brush, 2007). Often, it is viewed as an optional add-on rather than a vital component of literacy instruction requiring a fundamental shift in literacy pedagogy and assessment (O’Brien & Scharber, 2008). Due to the emergence of the Internet as today’s defining technology for literacy and learning (Leu, 2007) and the rapid shift in literacy practices from page to screen (Lankshear & Knobel, 2006), a central question becomes: How can educators assess students’ online literacy competencies, track progress over time, and identify strengths and weaknesses that can be addressed through instruction?

This chapter highlights research that suggests the Internet is reshaping reading, writing, and communication and sparking a transformation in the ways we teach and assess literacy and language arts. It is structured around the notion that educational assessments should draw on principles of evidence-centered design (National Research Council, 2001) to answer three essential questions: (a) What evidence is needed to represent proficiency in online literacy and language arts? (b) What situations or tasks can elicit such evidence? (c) How can this evidence be interpreted in meaningful ways? (see Figure 45.1).

The first section provides a rationale for the types of evidence we should be gathering about students’ online literacy development. Illustrative examples of what these assessments might look like can be found in the latter sections of the chapter. However, assessments of online literacy and language arts are just beginning to emerge (see, for example, Coiro, 2009a; Leu et al., 2008), and their applications in classrooms are preliminary in nature. By drawing attention to contemporary research and principles of evidence-centered design, we intend to incite thinking that will provide a vision for future work in this area.

What Evidence is Needed to Represent Proficiency in Online Literacy and Language Arts?

In today’s global knowledge society, print is no longer the dominant form of communication or expression (NCTE, 2007). Rather, the Internet and other ICTs have rapidly accelerated students’ access to, and production of, a range of digital, nonlinear, multimodal, and interactive texts that are often unbounded in time and space (New Media Consortium, 2007). These dynamic online texts and their associated literacy practices require dynamic assessments that are sensitive to the diverse, multiple, and rapidly changing ways in which learners read, write, view, listen, compose, and communicate information in the 21st century (IRA/NCTE, 2010). The literature in this area suggests that language arts assessments in a digital age should reflect evidence of: (a) a broad range of richly intertwined print and digital language arts skills and practices, (b) an important set of dispositions toward participating in globally networked communities,
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Figure 45.1 Assessment framework for teaching and learning English language arts in a digital age.

and (c) diverse perspectives about what counts as literacy in school classrooms.

Broad Range of Print and Digital Language Arts Skills and Practices Knobel and Wilber (2009) argue that three interlocking online literacy practices—participation, collaboration, and distribution—are challenging how schools traditionally define the ways readers and writers use and respond to texts. From these three practices emerge a whole host of additional language arts skills beyond reading, writing, listening, and speaking. These include, but are not limited to, the ability to review, critique, respond, tag, rate, remix, record, and collaboratively build on collective knowledge bases to generate new digital texts—while taking care to follow copyright laws and to be sensitive to how ideas might be perceived from diverse points of view.

Elsewhere, Churches (2009) outlines digital extensions to traditional classroom literacy practices associated with note taking, journaling, discussing, drafting, diagramming, displaying, presenting, and otherwise communicating with technology for informal and formal purposes. Each of these practices introduces skill sets that demand a broader range of assessment measures to inform teachers seeking to prepare students for success in a digital world. Importantly, evidence from these assessments should move beyond rote recall or isolated skills practice to evaluate performance on tasks that blend information seeking, problem solving, and knowledge generation for authentic purposes (Shepard, 2000). In addition, educational assessments should occur within daily classroom activities and provide timely, contextualized, and useful information about what students can do and not just what they cannot (Tierney, 1998).

More specifically, authentic assessments should capture evidence in three key areas central to language arts performance in a digital age. First, authentic language arts assessments should be designed to capture students’ ability to critique, evaluate, and synthesize multiple sources of simultaneous and often disparate information while applying a broad range of print and digital literacies (NCTE, 2007). Second, evidence should document students’ ability to collaboratively generate and creatively produce print and digital information for many purposes and audiences (ATC21S, 2008; New Media Consortium, 2007). Third, assessments should elicit information about the level of fluency and efficiency with which students are able to apply these literacies across diverse print and digital contexts (Information Fluency, 2009; Leu, Kinzer, Coiro, & Cammack, 2004).
**Dispositions Toward Participating in a Global Online Community** Assessments of online literacy and language arts should also document students’ evolving dispositions toward participating in globally networked communities (Coiro, 2009a; Popham, 2009). Positive dispositions, or attitudes and beliefs, are key dimensions of effective learning, particularly for students growing up in a digital information age (Johnston, 2005). In the context of language arts curricula, Web 2.0 technologies (such as open-source information and social networking sites) and emerging learning standards demand that online readers and writers be personally productive, socially responsible, and able to collaborate with other members of a globally networked community (e.g., Johnson et al., 2009). In addition, 21st-century learners are expected to be adaptable, imaginative, self-directed, emotionally resilient, and able to demonstrate effective oral and communication skills (American Association of School Librarians [AASL], 2007). Consequently, teachers require assessments that document important competencies such as strong interpersonal communication skills, an understanding of productive team dynamics, an appreciation of differences in cultural practices and work patterns, and the ability to respond appropriately to peer feedback (Aflerbach, 2007).

One important resource that can guide the instruction and documentation of such competencies is the Standards for the 21st Century Learner in Action developed by the AASL Learning Standards Indicators and Assessment Task Force (see http://www.ala.org/ala/mgrps/divs/aasl/aaslproftools/standardsinaction/standardsinaction.cfm). This document contains grade level benchmarks, action examples, and accompanying rubrics reflecting critical stages of development. These guidelines can help educators conceptualize, teach, and assess 21st-century learner dispositions such as emotional resilience, persistence, social responsibility, and personal productivity. Rather than suggesting one set of guidelines for all situations, we encourage educators to build on and adapt these ideas in ways that suitably address their unique educational contexts.

**Diverse Perspectives of What Counts as Literacy in School Classrooms** A third characteristic of literacy assessments for a digital age is that they reflect diverse perspectives about the knowledge and skills that are valued in the English language arts curriculum. As the literacy community seeks to more accurately reflect literacy as influenced by a wide range of cultural and personal histories, we are in need of assessment practices that preserve, respect, and make space for diverse interpretations about existing text while broadening the ways learners might creatively respond to text for academic and personal purposes (Cope & Kalantzis, 2000; IRA/NCTE, 2010; Moje, Willes, & Fassio, 2001). In other words, assessment practices should help students connect what they are to what they do in school (Galllego & Hollingsworth, 2000).

Specifically, future assessments of online literacy and language arts should honor and celebrate students’ home culture and daily literacies (see Moll, Amanti, Neff, & Gonzalez, 1992). For example, O’Brien, Beach, & Sharber (2007) describe ways middle school teachers integrated multi-media and new literacies practices to build classroom community, increase motivation, and develop agency in meeting both school-based and personally relevant goals. Language arts assignments involved designing video games of the ideal city, populating it with characters, and writing narratives about the characters and their video gaming experiences; collaboratively writing radio plays produced using Garage Band; and using Comic Life (http://comiclife.com/) as a context for writing narratives with characters from popular science fiction stories or video games. While these media-rich activities helped students make connections across their home and school lives, struggling readers in particular perceived improvements in their own reading and writing abilities as a result of collaboration and participation. Documenting evidence of students’ engagement in digital literacy experiences that transcend the boundaries of home and school may have the potential to shape adolescents’ identities as social and literate individuals (see also Burnett & Wilkinson, 2005; Perry, 2006).

**What Situations or Tasks Can Elicit Such Evidence?**

A second consideration for designing assessments identifies a range of situations or tasks that elicit evidence of proficiency in online literacy and language arts. Recommendations in this area suggest that assessment be viewed as authentic and situated in classroom practice (Darling-Hammond & Snyder, 2000), while incorporating multiple measures and broader methods to document the strategies, thinking processes, and attitudes specifically associated with online literacy development. As online literacy practices become more prominent in school, it is critical that educators move beyond thinking about digital assessments as isolated tests and view these more as authentic opportunities for students to practice and apply the skills, knowledge, and dispositions they will need as readers and writers in a digital age. Performance-based learning activities can then be seamlessly integrated throughout the school day and paired with observational notes, self and peer checklists, and an examination of student work products. Examining such artifacts formatively for signs of development can help pinpoint students’ strengths and weaknesses and guide future instruction. To that end, classroom embedded language arts assessment situations may include opportunities to incorporate: (a) authentic multidisciplinary problems to solve, (b) digital communication and workplace tools, and (c) embedded digital scaffolds.

**Authentic Multidisciplinary Problems to Solve** Literacy education in the 21st century must adequately prepare students for participation in a knowledge-based economy (Bereiter & Scardamalia, 2006). The ability to identify important problems, and then efficiently locate, critically evaluate, synthesize, and communicate potential solutions...
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to those problems is a key resource for social and economic development (Leu et al., 2004). Collaborative online literacy experiences engage students in these inquiry-based processes as they negotiate meaning and construct new knowledge using online resources and networked communication tools. Moreover, visions of classroom instruction in the new millennium require learners to weave their knowledge of core subjects (e.g., science, math, history, and language arts), and appreciation of diverse perspectives, into the context of interdisciplinary issues such as global health, civic literacy, and economic stability (Trilling & Fidel, 2009). Consequently, valid assessments of online literacy and language arts should engage students in digital reading, writing, and communicating tasks contextualized in problem-based, interdisciplinary, real-world issues.

Authentic online projects such as those listed in the Teacher’s Guide to International Collaboration on the Internet (see www.ed.gov/teachers/how/tech/international/guide_pag2.html) or sponsored by The Center for Innovation in Engineering and Science Education (CIIESE; see www.ciese.org/collabprojs.html) encourage students to use ICTs to construct knowledge, share data, and negotiate meaning across disciplines and among learners who come from various cultural traditions and hold diverse points of view. As a result, students learn content and simultaneously develop skills that are vital to participation in an information age (Castek, 2008). Performance based scoring systems could be woven into these types of projects to track progress and be used to provide a richer picture of what all students know and can do. Multimedia enhancements such as text-to-speech reading aids, annotation tools, and scaffolds for learning can engage students in discussions about the nature of their writing while developing: (a) a meta-awareness of the various ways we write for different purposes, audiences, and contexts (Jacobs, 2008), and (b) the ability to fluently ‘code-switch’ between formal and informal patterns of language use (see Turner, 2009). Turner provides examples of text convention charts and checklists that can be used to facilitate and document students’ ability to translate writing conventions across multiple situations in ways that privilege both formal and informal writing contexts. Incorporating these practices for instruction and assessment into the language arts curriculum prepares students to adjust their use of written language (e.g., conventions, style, and vocabulary) to communicate effectively with a variety of audiences and for different purposes (see IRA/NCTE, 1996).

Digital Communication and Workplace Tools Digital communication technologies have significantly shifted the way we interact in our daily lives and in the workplace (New Media Consortium, 2007). A wide range of social networking and information sharing tools (such as Facebook, Twitter, Skype, etc.) are emerging at a rapid pace. These applications have given rise to new means of communication, new places to communicate, and new avenues of interaction, thereby making it possible to connect with a wider and more diverse group of individuals than ever before (Johnson et al., 2009).

Consequently, language arts assessments should incorporate the information and communication tools used in the workplace and in students’ daily lives (e.g., interactive blogs, wikis, VoiceThread, instant messaging, email, etc.). These applications have been used successfully in classrooms as forums for posing and answering questions (Charron, 2007), individual reflection (Richardson, 2006), higher-level thinking about content (Zawilinski, 2009), and cross-classroom collaboration (Boling, Castek, Zawilinski, Barton, & Nierlich, 2008). Unlike paper and pencil products, networked communication tools generate student work that can be archived in a searchable digital portfolio. Once catalogued, educators can examine students’ writing development alongside their communication and collaboration skills with ICTs. These assessment practices elicit tangible evidence of online literacy development and support teachers in addressing the skills required for communication and collaboration in a global society.

For some educators, online communication practices (e.g., instant messaging [IM] and texting) prompt concerns that non-standard writing forms might negatively interfere with students’ use of standard conventions in formal academic writing. However, rather than simply correcting or dismissing these conventions as inappropriate, Jacobs (2008) and others (e.g., Helderman, 2003; Lee, 2002) argue it is important that students are able to communicate in both worlds (IM and academic writing) and to thoughtfully choose the formality of language that is appropriate for each. To guide teaching and assessment in this area, educators can engage students in discussions about the nature of their writing while developing: (a) a meta-awareness of the various ways we write for different purposes, audiences, and contexts (Jacobs, 2008), and (b) the ability to fluently ‘code-switch’ between formal and informal patterns of language use (see Turner, 2009).

Embedded Digital Scaffolds In addition to engaging students in solving authentic problems, in part with online communication tools, future language arts assessment practices should begin to explore how digital scaffolds might be used to provide a richer picture of what all students know and can do. Multimedia enhancements such as text-to-speech reading aids, annotation tools, and scaffolds for summarizing, synthesizing, and reflection make it possible for academically diverse students to access online content (Anderson-Inman & Horney, 2007), solve real-world problems, and actively contribute to digital learning communities. Digital scaffolds accommodate the individual needs of diverse learners and reduce the chances that decoding and language differences impede learning (e.g., Edyburn, 2007; Proctor, Dalton, & Grisham, 2007).

In contrast to standardized tests that highlight areas where students fall short, future assessments need to make use of the wide range of digital tools that promote literacy success. Educators might, for example, explore the applications of emerging technologies such as supported e-texts (Anderson-Inman, 2004), cognitive rescaling tools (e.g., auto-summarizing features) (Edyburn, 2002), and tiered digital learning materials (Edyburn, 2007) that allow readers to alter the difficulty of text and formulate responses in multiple modalities. Other tools such as spell checkers, graphic organizers, concept maps, language translators,
and word prediction software build on the strengths of academically diverse learners as they read, compose, and respond to texts. These digital scaffolds are especially supportive for diverse learners as they navigate the range and complexity of resources found on the Internet. In an age of rapidly emerging ICTs, digital scaffolds need to be made available during assessment and instruction to compensate for learning difficulties so all students can demonstrate their true language and literacy abilities.

How Can this Evidence be Interpreted in Meaningful Ways?

The third component of evidence-centered assessment practices is to ensure that valid evidence of students’ digital literacy development, in all its complexity, is represented and interpreted in ways that improve teaching and learning. As the primary agents of assessment, teachers are responsible for translating evidence about students’ existing language arts practices into meaningful instructional decisions (Johnston & Costello, 2005). To effectively inform teacher decision-making, assessment practices for online literacy and language arts should: (a) make visible information about students’ online reading and writing processes and products, (b) inform interpretations of students’ literacy and language development in both individual and group contexts, and (c) include opportunities for students and teachers to engage in productive literacy conversations about their progress and make contributions to the classroom community.

Online Literacy Processes and Products

If teachers are to make informed decisions about how to support online inquiry and creative knowledge generation, assessments should be designed to capture both the processes that occur during these tasks as well as the resulting learning products. Thus, assessments should include reporting procedures to elicit multiple forms of data from which teachers can observe and document important developments and areas of challenge during literacy learning (IRA/NCTE, 2010).

In a classroom or lab setting where students use laptops, process and product data can be collected easily with online recording software such as Camtasia (see www.techsmith.com/camtasia.asp) or I Show U (see www.store.shinywhitebox.com/home/home.html). The software creates a video recording of students’ actions and voices as they spontaneously engage in online reading and writing processes, just as if an observer were watching over their shoulder. Teachers, students, and peers can then play back the videos to better understand how students accomplish (or struggle with) tasks such as using search engines, constructing meaning and evaluating authorship across multiple sources, participating in IM exchanges, or collaboratively organizing and composing information in a shared document editor (e.g., Google Docs) or a social networking environment (e.g., Facebook or Ning). In addition, online tools such as Quia (www.quia.com) or Survey Monkey (www.surveymonkey.com) can automatically compile student-generated responses for review.

Students might also be asked to think-aloud as they engage with these tasks to foster their own metacognitive awareness of the successes and obstacles they encountered along the way (see Kucan & Beck, 1997). Through dialogue and discussion, students may better understand and internalize their own strengths and set goals for online reading improvement. Reflection that takes place while students are engaged in the activity, and after completing the activity, promotes continuous learning in authentic contexts and is integral to the online inquiry process (Chappuis & Chappuis, 2007/2008).

Digital recordings can also provide a specific reference point for where in the online reading or writing process a group of students, or one student in particular, needs the most support (Coiro, 2009b). These challenging spots can then become the focus of future instruction. Over time, video recordings offer evidence of literacy development at certain points in the process, which might then be compiled in an online e-portfolio system (see, for example, Barrett, 2008) and explicitly linked to increases in the quality of students’ associated literacy products over time.

Consider Digital Literacy Performance in Both Individual and Group Contexts

In addition to documenting literacy processes and products, it will be important for language arts assessments to offer feedback about a student’s individual contribution to an assigned online task as well as the quality of his or her working group’s interactions and discussion (Johnston & Costello, 2005). By analyzing information from both types of data sources, teachers are able to attend to what students can do independently as well as how they contribute to group problem-solving and knowledge generation processes that are often embedded within authentic online literacy tasks.

As readers independently engage with reading and writing tasks, teachers might, for example, document evidence of a student’s reading comprehension strategy use, dispositions toward online texts and tools, or use of appropriate discourses for communicating in a range of online contexts. Checklist assessments aligned to research-based criteria for particular literacy tasks are one effective way to help teachers (and students) determine individual strengths and areas of improvement (Afflerbach, Reutskili, & Russell, 2007). Individual performance might also be documented across anticipated phases of an online reading or writing process. This information could then be used to estimate where a reader falls along an expected continuum of online literacy development and inform realistic next steps for instruction (see Coiro, 2007). Rich feedback about an individual’s literacy performance supports teachers in identifying strengths and areas of need, and differentiating instruction accordingly (Riddle Buly & Valencia, 2002). Teachers can gather evidence of productive group work (e.g., attentive listening, progress toward a shared goal) through observational checklists, reflective progress reports,
and students’ self-assessments of their teammates and their own contributions to the project.

Include Opportunities for Productive Literacy Conversations Finally, as we move into the next millennium, Tierney (2000) argues for a shift toward learner-centered assessment practices that “afford students opportunities to engage with teachers, caregivers, and stakeholders in meaningful partnerships involving genuine decision making” (p. 244). Thus, assessments of digital literacy development should be organized around students and teachers working together in literacy conversations to observe, reflect, and offer feedback on their progress and document learning over time (Serafini, 2001; Tierney, 1998). Productive literacy conversations are those that invite students to provide their own evidence of what they have achieved and to be involved in goal-setting activities that can directly inform future instruction (IRA/NCTE, 2010; Johnston, 2003). During these conversations, both teachers and students ask questions as part of an authentic inquiry process that engages them with “productive literacy practices and identities” (Johnston & Costello, 2005, p. 259) that inform literacy instruction.

Research also suggests student and teacher talk focus on evidence of online literacy development from multiple examples of student work in varied assessment tasks to better understand the complex literacies students are acquiring in ways not revealed in conventional standardized test scores of reading and writing (Affl erbach, 2007; IRA/NCTE, 2010). In addition, productive assessment conversations among groups of teachers provide a context for drawing on multiple sources of information to consider alternative solutions beyond the limitations of one’s own assessment lens (Johnston, 2003).

Two Challenges for the Future of Online Literacy Assessment In closing, as we look to the future, two points will continue to challenge progress in developing authentic and practical classroom assessments of English language arts in a digital age. The first issue is one of accessibility. It is vital that schools keep pace with the influx of new innovations and networking capabilities in ways that ensure students and teachers have equitable access to high-powered computers, high-speed networks, and the range of mobile and interactive whiteboard technologies that might be used to teach, monitor, and evaluate performance in online reading, writing, and communication skills. This will be especially challenging for districts situated in economically disadvantaged communities who struggle more often with issues of accessibility on a regular basis (e.g., Henry, 2007).

The second, and perhaps more pressing issue, is one of flexibility. Even with full access to equipment and networked connectivity, the ultimate challenge in assessing literacy in a digital age is that online texts, tools, and reading/writing contexts will continue to change rapidly as new technologies emerge (Leu et al., 2004). Yet, “the need for learners at all levels who can solve new problems, generate new knowledge, and invent new language practices will remain constant” (IRA/NCTE, 2010). To help learners realize their potential as citizens in a digital age, it is imperative that the literacy community, and its various stakeholders, continually reconsider and expand what it means to skillfully read, write, and communicate with ICTs. Subsequent revision and reconfiguration of online literacy measures will need to realistically keep pace in ways that document performance on a range of outcomes, not just those that cause direct improvements on conventional measures of print literacy.

As we venture forward, the journey will no doubt be challenging. Yet, it is a challenge that can no longer be ignored. For those who seek to venture forward, we believe practices that are grounded in evidence-centered design and driven by flexible solutions to address rapid and continual change in both technology and literacy hold much promise toward better understanding effective teaching and assessment practices of English language arts in a digital age.

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