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Mehdi Khosrow-Pour

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Digital Literacy for the 21st Century

D**Hiller A. Spires***North Carolina State University, USA***Casey Medlock Paul***North Carolina State University, USA***Shea N. Kerkhoff***North Carolina State University, USA*

INTRODUCTION

In the past few decades, technology has spanned the globe, connected people in a whole new way. As a result, citizens of all countries have not only had to learn to use new technology, but also learn how to interact with one another. Skills that comprise these abilities have been combined under the term “digital literacy.” The purpose of this chapter is to (a) define digital literacy and its changing nature, (b) discuss implications of digital literacy on contemporary schooling, (c) demonstrate the impact of digital literacy on digital citizenship, and (d) analyze the implications of digital literacy on educational equity.

BACKGROUND

Almost two decades ago, Gilster (1997) defined digital literacy as the “ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers” (p. 1). At this time, the Internet was in its infant stages. More than a decade later with Internet usage in full swing, Fieldhouse and Nicholas (2008) asserted that terms like *literacy* and *fluency* can be used to describe how users find and evaluate information within digital environments. Digital literacy involves any number of digital reading and writing techniques across multiple media forms, including: words, texts, visual displays,

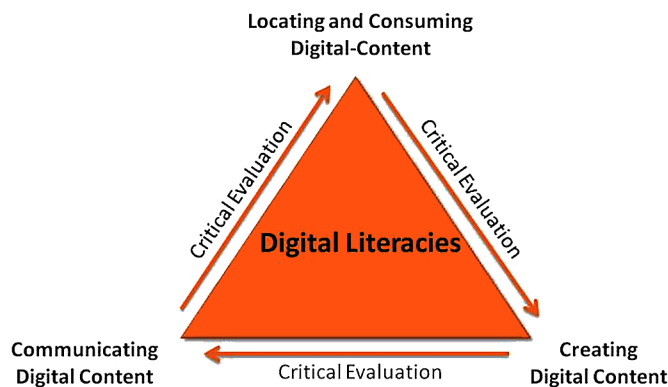
motion graphics, audio, video, and multimodal forms. In the same way that literate individuals can negotiate print text through the processes of reading and writing, literate users of technology are able to consume and produce digital compositions. There are many cognitive processes at work, along a continuum from *consumption* to *production* when a reader is immersed with digital content. The digital context is challenging for all readers due to the fluid nature of the Web and the demand for critical judgments (Spires & Estes, 2002) as the reader makes decisions about how to locate information as well how to discern the reliability and credibility of that same information.

WHAT IS DIGITAL LITERACY?

Spires and Bartlett (2012) have divided the various intellectual processes associated with digital literacy into three categories: (a) locating and consuming digital content, (b) creating digital content, and (c) communicating digital content (see Figure 1). Learners must develop evaluative dispositions as they navigate digital content. A discerning mindset is essential in order to interact with online resources with accuracy. Without critical evaluation, the learner may easily be directed by the technology rather than the learner directing the inquiry.

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Figure 1. Digital literacy practices involve the ability to locate and consume, create, and communicate digital content, while simultaneously employing a process of critical evaluation
Adapted from Spires & Bartlett (2012)



Locating and Consuming Digital Content

It is essential to develop the skills to locate, comprehend and consume digital content on the Web. Central to being effective with the Web is strategically searching for information and evaluating its accuracy and relevancy (Leu et al., 2008). There is consensus that effective Web search skills must be developed for educational success in a digital society, and instruments such as The Teaching Internet Comprehension to Adolescents (TICA) checklist can ensure that students have the necessary prerequisite Web search skills (Leu et al., 2008). However, more challenging is how to incorporate the effective teaching and development of Web search skills in the classroom (Moraveji et al., 2011). Nevertheless, some important skills are considered necessary for locating and using digital content: domain knowledge, a working knowledge of how to use search engines, basic literacy skills, and a general knowledge of resources available on the Web (Moraveji et al., 2011). In addition to building on the ability to craft productive Web search terms, search lessons should involve direct modeling of the use of search techniques, differentiating between domain names, and querying sites for accuracy and transparency.

Creating Content

Digital content is easily created by teachers and students alike through multiple media and a variety of Web 2.0 tools. The implementation of digital content may be an important and effective method of enhancing teaching and learning (Bakkenes, Vermunt, & Wubbles, 2010), enabling teachers to embrace the 21st century skills that students are expected to master. Digital resources can also free up teachers, allowing them to spend more time facilitating student learning and less time lecturing. Allowing students to create and consume digital content in the classroom may increase engagement while also encouraging the development of skills needed for a technological society. For example, students can create video content with easy-to-use video editors such as *Animoto*, *WeVideo*, and *Powtoon*, just to name a few. Because there is a low bar for technical expertise, students can spend more time on the quality of the content rather than learning the process of a new tool. An added benefit is that the products look polished and professional. Although the creation of digital content is becoming increasingly simple, personalization of learning will require teachers to locate and utilize a variety of digital resources to meet the needs of every learner. Personalization will also

put a heavier emphasis on asking students to show mastery of learning by producing digital content. This generative process requires more time from teachers in terms of designing appropriate rubrics for performance-based learning.

Communicating Digital Content

Digital content must be communicated effectively in order to be a useful educational medium. Using social networking sites like *Facebook*, *Twitter*, and *Instagram* requires users to understand and manipulate information in multiple formats. Web 2.0 tools are social, participatory, collaborative, easy to use, and facilitate the creation of online communities. Being able to communicate digital content using mobile devices such as cellphones and tablets provides convenience and immediacy to the communication process for teachers and students. Additionally, it provides access to an infinite set of people and digital content resources globally to enrich the learning experience. This type of communication affords the possibilities of more customization and personalization for individual learners' interests and needs, which has the potential to increase student engagement in academic learning.

A popular type of digital communication is the act of curating. The capacity to curate at a sophisticated level, both in terms of content and visual appeal, is quickly becoming a necessity for educators who engage in online teaching and learning (Thompson, 2015). The word curate comes from the Latin root *Curare*, or "to cure," and historically has meant "to preserve" (Mihailidis & Cohen, 2013). As students learn to be creators and curators of digital content, there is some evidence that it contributes to their ability to be critical readers of digital texts (O'Byrne, 2012). The word curate derives from the Latin root *Curare*, or 'to cure.' To curate, historically, has meant to take charge of or organize, to pull together, sift through, select for presentation, to heal and *to preserve*. Within digital spaces, organizing and preserving online content is the purview of the individual (Mihailidis

& Cohen, 2013). This online communication trend has created a need to understand how individuals select, sort, synthesize and display content within these spaces.

The Changing Nature of Digital Literacy and Learners

Contemporary education is permeated by the millennial generation, also referred to as Generation Y and the Net Generation. This group is defined as those individuals who were born between the early to mid-1980s and the early to mid-2000s, possessing the following traits: confident, team oriented, conventional, pressured and achieving (Howe & Strauss, 2000). This generation, bigger than previous generations, is entering the workforce and contributing to a shift in our society (Winograd & Hais, 2011). This generation is immersed in a world of multimodality, or how individuals make meaning with different modes, such as print, video, speech, music, or gesture. At the heart of multimodality, is semiotics, which is the study of signs (Kress & Van Leeuwen, 1996). As society has shifted from written to visual texts in contemporary culture, more demand has been placed on teachers to learn how to make instructional changes that take these shifts into account. Leu and his colleagues (Leu et al., 2015) used the term *deictic* to refer to the changing nature of literacy, which is prompted by the constantly changing technologies within our society. By all accounts, these changes will continue to take place since the total number of Internet users is at over 3 billion worldwide and growing.

Digital Citizenship

As technology has spread across the globe, our world has become more connected than ever. This has created a global virtual world that all technology users inhabit, and as a result, technology users have had to learn how to become "digital citizens" (Isman & Canan Gungoren, 2014). Although there are various definitions of this term,

the definitions are similar; they express that first and foremost, a digital citizen must be able to use technology intelligently. Furthermore, one should understand cultural and societal issues as they relate to technology; as a result, digital citizens demonstrate various characteristics. For example, Isman and Canan Gungoren (2014) state:

[They] practice legal and ethical behavior; advocate and practice safe, legal, and responsible use of information and technology; exhibit a positive attitude toward using technology that supports collaboration, learning and productivity; demonstrate personal responsibility for lifelong learning; and exhibit leadership for digital citizenship. (p. 73)

In order to foster the development of these skills, various organizations have begun to develop models and programs designed to assist in educating people on digital citizenship. For example, ISTE published a model listing behaviors associated with digital citizenship (Brichacek, 2014). Such behaviors include “no stealing or damaging others’ digital work, identity or property;” “using digital tools to advance learning and keeping up with changing technologies;” “protecting personal information from forces that might cause harm;” and “equal digital rights and access for all” (Searson, Hancock, Soheil, & Shepherd, 2015, p. 731). Another non-profit organization, *iKeepSafe*, worked with Microsoft and AT&T to develop an online questionnaire that measures digital safety skills and attitudes in six areas, known as the BEaPRO index: balancing digital usage, practicing ethical digital usage, protecting personal information, maintaining healthy and safe relationships, building a positive reputation, and achieving online security (Searson, Hancock, Soheil, & Shepherd, 2015; *iKeepSafe*, 2015).

Still, there is much work to be done in developing global digital citizenship. The findings from *iKeepSafe*’s questionnaire indicated “although many individuals *want* to foster good digital citizenship practices, most have limited knowledge

about how to do so” (Searson, Hancock, Soheil, & Shepherd, 2015, p. 733, emphasis in original). These authors provide a list of recommendations and actions needed to help further global digital citizenship. They suggest that both national and local leadership organizations, such as public policy agencies, law enforcement, and industry leaders, work together in order to tackle the issue. Furthermore, they recommend that educational institutions begin to provide professional development for teachers in order to educate teachers as to how they can teach their students to be digital citizens. They also maintain that stakeholders must be held accountable for privacy and safety of community members, and reported incidents should inform digital citizenship education services and policy development.

Although digital citizenship is a fairly new concept, it is one that is highly important in our globalized, virtual world. It involves not only competent technology use, but also responsible and ethical use of the web. Digital citizenship is largely considered an aspect of digital literacy, and many organizations are working to understand how to include it in digital literacy education.

Digital Literacy and Educational Equity

The digital divide is a gap in access to or usage of ICTs between people, demographic groups, or countries (OECD, 2001). In other words, the global digital divide is one of access to the Internet and also one of users’ competence with ICTs. Access to ICTs continues to be divided within countries as well as among countries and is often associated with socioeconomic status. As of January 2015, only 42% of the world was active Internet users with Canada holding the highest percentage of 93% and India holding the lowest percentage of Internet users at 19% (Kemp, 2015). Access and usage are related in that lack of access leads to less practice digital literacy skills, whereas more access leads to more opportunities to practice.

Problems of access include cost of computers and subscriptions, broadband width of the Internet, and restrictedness of content (Tongia, 2005). Lack of access can be seen at the country-level, such as governments censoring content on the Internet and restricting what sources and what information citizens can obtain. Lack of access can also be seen at the demographic level when certain demographic groups are able to spend more time on the Internet than other groups. In the US, research has shown that students from underprivileged schools spent less time using ICTs even though the amount of computers and broadband width were similar across schools (Leu et al., 2015). One reason for this could be that digital literacy is not tested on government issued assessments tied to funding; therefore, time is spent on what is tested in order to score higher on the assessments and receive needed funding (Leu et al., 2015). This phenomenon has implications for future K-12 assessments.

SOLUTIONS AND RECOMMENDATIONS

Digital Literacy and the Impact on Contemporary Schooling

As technology has become more integral to students' lives, there has been an ever-increasing digital "home-school divide" (Honan, 2006, p. 41); students are using technologies outside of school that are not available in school, while educators struggle to effectively use what technology they have in their classrooms (Henderson, 2011). There is still great debate on exactly how to integrate digital literacy instruction into traditional instruction, and many studies have been and are still being conducted in an attempt to understand how best to bridge the two together (Kervin, Verenikina, Jones, & Beath, 2013; Henderson, 2011; Walsh, 2010; 2008).

Nevertheless, there is little debate on the value of these skills; many countries have begun

to reform their education programs to include better digital education. Some countries even have standards and requirements for students to achieve digital literacy. In 2008, Australia began its Digital Education Revolution in order to equip schools, teachers, and students with the technology necessary to provide a quality digital education. England has Computing Programmes of Study (United Kingdom Dept. of Education, 2013) as part of its National Curriculum, with part of its stated goal that "pupils become digitally literate—able to use, and express themselves and develop their ideas through, information and communication technology—at a level suitable for the future workplace and as active participants in a digital world" (Purpose of Study section, para. 1). The International Society for Technology in Education (ISTE; 2007) has also developed standards for students, teachers, and administrators.

Not only has digital literacy changed educational standards, but it has also changed the content that must be taught in schools. Although today's students' are often considered "digital natives" (Prensky, 2001), they are not necessarily able to use these digital tools in a knowledgeable or critical way (Jones et al., 2010). Students therefore must be taught such skills and how to use technology effectively (Leu et al., 2015), including evaluating and critically analyzing information.

Students must also be taught about cyber safety, "digital footprints," and how to be responsible online (Osborne & Connely, 2015). In fact, many educational programs are now including standards that foster the teaching of digital responsibilities, such as respecting copyright laws, using valid information, and following safe and ethical behaviors when online. (American Association of School Librarians, 2007; ISTE, 2007). Government organizations are also making sure such education is available to students. For example, Qatar's Ministry of Information and Communications Technology, known as ictQATAR (2015), works alongside teachers and parents to teach children Internet responsibility and safety.

Digital literacy has had—and is continuing to have—an impact on contemporary education. Information is readily available to students, and educators are working to teach adolescents how to use this information effectively, ethically, and responsibly. One organization, the Partnership for 21st Century Learning, was developed in order to help foster 21st century learning for students through collaborative partnerships. The 21st Century Learning Framework (Partnership for 21st Century Learning, 2009) has been used in the U.S. as well as other countries to support the inclusion of 21st century skills in education. Although educators are still trying to discover exactly how digital literacy fits into the classroom, it is clear that digital literacy has already greatly altered modern education.

FUTURE RESEARCH DIRECTIONS

Future research should focus on clarifying best practices for teaching students how to navigate digital environments effectively. Specifically, teachers need to know how to help students locate, create and communicate digital content in productive and ethical ways. Additionally, teachers need best practices for how to integrate game-based learning into their classrooms and support students as they navigate virtual spaces related to content learning. One emerging trend is Online Reading Comprehension Assessments (ORCA), in which students' capacity to conduct effective information searches is assessed in a controlled Web environment (Leu et al., 2015). Online and offline reading require different skills, so assessments must be sensitive to the distinctions.

CONCLUSION

In this chapter our aim was to provide a definition of digital literacy and how it is evolving, discuss the implications of digital literacy on contemporary schooling, demonstrate the impact of digital

literacy on digital citizenship, and analyze the implications of digital literacy on educational equity.

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KEY TERMS AND DEFINITIONS

Digital Citizenship: The capacity to conduct oneself in a responsible and ethical manner within public digital environments.

Digital Content: Content that uses information and communication technologies.

Digital Curation: The capacity to select, sort, synthesize and display digital content.

Digital Divide: The gap and access to or usage of ICTs between people, demographic groups or countries.

Digital Footprint: An individual's profile that is depicted to others through the Web.

Digital Literacy: The ability to locate, create, and communicate digital content.

Online Reading Comprehension: The ability to locate reliable sources on the Internet and synthesize for multiple purposes.

Web 2.0 Tools: Technology tools that allow interactivity among users and digital content.