

The Role of Technology in the Transformation of Twenty–First Century Literacy Skills



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INTRODUCTION

Literacy rates for adults and youth continue to rise around the world. Overall, recent statistics indicate more than half of countries in the database have youth literacy rates of 95% or higher (UNESCO, 2013). These statistics reflect youths' ability to read and write; however, they may not reflect literacy knowledge needed for daily tasks in a computer-driven, global society. In the United States, online exams aligned with the Common Core State Standards will soon require students to demonstrate higher-order literacy skills such as finding and evaluating online information (Classroom News, 2013). The growth of the Internet and emerging technologies has affected the communication and collaboration of all academic disciplines and professions. The transition from print to web based media has transformed skills necessary for success in school and work. In the 21st century, methods of locating, communicating, and citing information have changed and will continue to change with advances in technology. This article includes a discussion of contemporary definitions of literacy and existing literature to clarify what is currently known about 21st century literacy skills. New technologies and methods of communication are transforming these skills. Shifts from traditional to digital information access and communication methods will be a major theme of this article.

BACKGROUND

An International Reading Association (IRA) position statement, titled "New Literacies and the 21st Century Technologies," reported, "to become fully literate in today's world, students must become proficient in the literacies of the 21st century technologies" (IRA, 2009, p.1). What does it mean to be proficient in 21st century literacies? New terminology describes the literacy skills of 21st century learners. The American Library Association (2013) defined *information literacy* as "the set of skills needed to find, retrieve, analyze, and use information" (para. 2). *Web literacy* refers to the knowledge an individual needs to find and navigate information, to examine content, and to determine the author and origin of a site (November, 2008). Other concepts, such as *new literacy* and *digital literacy*, represent changes in traditional views of literacy due to the impact of the Internet and technology tools. New literacies are skills required when using the Internet "to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others" (Leu, Kinzer, Coiro, & Cammack, 2004, p. 1572).

Information literacy, multiliteracies/multiple literacies, new literacy, digital literacy, and web literacy describe skills necessary for 21st century learning (Pilgrim & Martinez, 2013). These literacy terms represent various schools of thought from multiple

disciplines and reflect perceptions of literacies in the 21st century. Traditional skills such as reading with understanding and writing coherently remain important, but today's technology requires readers to develop more sophisticated literacy skills (Gunning, 2013). Online searches produce large amounts of information, and discernment is necessary to determine which sources contain appropriate, credible content. Readers encounter copious information, so they must be better at "organizing it, evaluating it, drawing conclusions, and conveying its essence to others" (Gunning, 2013, p. 545). In addition, online information interconnects through links and visuals in multiple ways, so understanding online text becomes a very complex process (Coiro & Dobler, 2007). Regardless of the verbiage used to define literacy in the 21st century, the modern connotation of literacy has increasingly reflected the ability to use technology, specifically the Internet, for gathering and communicating information (Leu & Forzani, 2012).

The digital world has transformed previous notions of literacy. In today's Information Age, readers face an explosion of information output and sources (A.L.A., n.d.). New literacy skills are necessary for information access and lifelong learning. The National Educational Technology Plan (2010), titled *Transforming American Education: Learning Powered by Technology*, called for change at all levels of education. The model of learning presented in this plan promoted the transformation of skills using technology and personalized learning to enable continuous and lifelong learning in a modern society.

21ST CENTURY LITERACY SKILLS

Almost 2.5 billion individuals around the world have Internet access (Internet World Stats, 2012). Interaction on the Internet requires readers to have "novel reading skills" (RAND Study, 2002, p. 4). Twenty-first century literacy has evolved to incorporate a continuous process of change in the ways readers locate information, communicate information, and cite information during literacy tasks. According to November (2008), "the rules of research have changed with society's move from paper to digital information" (p. 6). The changing rules refer to differences between traditional and technological resources and the knowledge technology users need

for successful Internet navigation. The objectives of this article are to describe the transformation of literacy skills necessary for locating, communicating, and citing information with new web-based technologies.

Locating Information

Locating information has changed with 21st century technology and changes in information retrieval and dissemination. The shift from the historical advantages of a physical library to the availability of online storage has profoundly affected information science (University of Texas, 2007). Although a primary purpose of libraries continues to be identifying, acquiring, disseminating, and preserving records of scholarly communication (University of Texas, 2007), information may now be accessed from anywhere and at anytime. At universities, "online journals and other digital resources increasingly constitute the research tool of choice for faculty, especially in the sciences" (p. 3). Statistics indicate students are fifty times more likely to choose an ebook over a printed textbook (University of Texas, 2007). In addition, students can now access information sources, such as national archives and journals, which previously had limited access, primarily for scholars.

Open resources are information sources that are accessible to a large audience with no fee by navigating the Internet. With increased connectivity, concepts like open content, open data, and open resources are gaining popularity (New Media Consortium, 2013a). "Open education advocates are working towards a common vision that defines 'open' as free, copyable, remixable, and without any barriers to access or interaction" (p. 7). Open resources provide opportunities for students to become more responsible for their learning. In addition, open resources, such as Khan Academy and iTunes University, provide opportunities for all citizens to access information outside of the classroom. Since open resources are becoming more abundant, readers must be more efficient at determining the validity and credibility of sources.

Administrators at many higher education institutions have considered open access policies. Open access (OA) involves the practice of providing online access to peer-reviewed scholarly research. In 2011, more than 20 universities and colleges, including Kansas, Duke, Stanford, and Harvard, announced the formation of the Coalition of Open Access Policy Institutions (Howard,

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