

Meet the Digital Natives On Their Own Turf: Suggestions for Teaching

Information Literacy Skills to the Google Generation

Marta Murvosh

Emporia State University

LI-837 - S. Bird - Fall 2010

Abstract

Under constructivist theory, effective teaching happens when instructors adapt lessons to their students' learning styles and instructional needs. By 2015, digital natives will make up 27 percent of the United States population, resulting in new challenges for their educators who are largely digital immigrants. When it comes to teaching information literacy, librarians and other instructors may find that to meet students' needs they must venture into the cyberspace and work with digital natives on their own online turf. This literature review includes articles from the professional literature in education and library science that on new discoveries of digital natives' information seeking and evaluating behaviors and describes efforts to use web-based tools for information literacy instruction.

Keywords: Digital natives, emerging adults, Google Generation, information literacy instruction, IL, ILI, Wikipedia, Flickr, weblogs, blogs, podcasts, virtual games, cyberspace, constructivist, information portals.

Meet the Digital Natives On Their Own Turf: Suggestions for Teaching
Information Literacy Skills to the Google Generation

Introduction

Those darn kids these days -- they sure think differently than their elders. High schoolers and college kids are impatient, unfocused, driven by the desire for instant gratification, and prone to poor critical thinking. At least that is the often heard refrain that has crept into informal communication, graduate school discussions, popular media reports, and into the professional education and library literature when speaking about the teens and emerging adults who were born after 1981 and grew up with using digital devices and the internet. Some claim that young people's use of the internet and digital tools or entertainments, such as computer games, have affected their research and critical thinking skills. However, there are questions as to the veracity of some of these claims about digital natives, who were born after 1981 (Gunter, Rowlands, & Nicholas, 2009; Rowlands et al., 2008a; and Rowlands et al., 2008b). Regardless whether digital natives' use of digital technology has impacted their information-seeking and critical thinking abilities, educators are dealing at least one very real issue: Digital natives' instructors are digital immigrants. Digital immigrants came of age without online technology and have adapted to digital developments and often speak a different language than the natives (Bussert, Brown, & Armstrong, 2008). Because information literacy (IL) and research can sound dry and boring to someone who is not an aficionado, it is librarians' responsibility to provide students with a context that helps them understand the importance of information literacy skills (Coulter & Draper, 2006).

One pathway to communicating an effective context for information literacy instruction (ILI) may be embracing online technologies and services in combination with a constructivist

approach. Such a combination provided the web-based tools are effective at both instruction and at capturing the attention of emerging adults, may offer librarians an effective means to deliver IL lessons. It may be that digital tools will prove to be a valuable resource for teaching digital natives, as well as subsequent generations. This literature review offers an overview of research from the past five years focused on digital natives, especially college-aged students, and an overview of digital technologies used at academic libraries to teach information literacy. In other words, the articles and book cited in this literature review offer information literacy instructors a selection of tools and new discoveries to help them meet the digital natives on their own cyber turf.

Limitations of this Literature Review

It is important to understand that this literature review is not comprehensive because digital technology and services, especially those that are web-based, are constantly changing and developing. The time-consuming nature of publishing peer-reviewed professional literature means that the current research addressing the use of digital and online technology and services as a tool for information literacy instruction lags at least one year behind the emergence of new tools or teaching techniques. Ideally, the best format for a literature review covering methods of information literacy instruction using digital technologies would be a searchable, regularly updated online format. Such a format would be a combination of a blog of new developments and a literature review organized like a bibliography with hyperlinks to databases, libraries, organizations, and publisher websites where the resources would be located. The author submits this literature view as a traditional term paper because of limits of her technical aptitude and time prevented her from creating an online literature review.

Why Should We Care About Digital Natives' IL skills?

The oldest of today's digital natives were still in diapers in 1982 when science fiction author William Gibson first coined the term "cyberspace" in his novelette *Burning Chrome* and in 1984 when he predicted an online computer network resembling the internet in his award-winning novel *Neuromancer* (Gibson, 1986, p 168; and Prucher, 2007). Although the computer hardware and software of the first decade of the 21st Century lack the intense total-surround virtual reality experience and artificial intelligences envisioned by Gibson, today's technology offer users powerful interactive digital tools to use for creation, socialization, and research for school, work, or personal reasons. Digital natives are coming of age and they will make up a huge portion of the United States' population. The U.S. Census projects that by 2015 that the 86 million young people born between 1981 and 2000 will make up 27 percent of the nation's population (U.S. Census, 2004). This paper uses the term digital natives and the Google Generation interchangeably. Strictly speaking, young people born after 1981 have been given several monikers, including Millennials, Gen Y, Net Gen (Bussert, Brown, & Armstrong, 2008), and those born after 1993 or 1996, depending on the source, the Google Generation (Rowlands et al., 2008b). The term emerging adult also is used by to describe teens and people in their early 20s, especially those attending college (Head & Eisenberg, 2009, February). Still, this author has observed that the term Google Generation is used in casual conversation to refer to digital natives who are as old as their early 20s.

The importance of information literacy was underscored in 2009 when President Barack Obama took up the IL cause, traditionally advocated by librarians and scholars. Obama made information literacy a national priority because: "Rather than merely possessing data, we must also learn the skills necessary to acquire, collate, and evaluate information for any situation. This new type of literacy also requires competency with communication technologies, including

computers and mobile devices that can help in our day-to-day decisionmaking [sic]" (Obama, 2009, para 1). The president went on to indicate that educators must adapt to information literacy instruction in a digital world. "Our [sic] Nation's educators and institutions of learning must be aware of — and adjust to — these new realities" (Obama, 2009, para 3).

This author believes that digital technologies would be a good match with information literacy instruction, especially if the educator applied Howard Gardner's theory of multiple intelligences and constructivist theory. Gardner theorized that people have different learning styles and intelligences. For instance, one person might learn through visual means and another through hands-on experiences (Brualdi, 1998). Constructivist thought hypothesizes that learners gain understanding through the interaction of their ideas with their experiences, and constructivist educators' lessons are student-centered (Grassian & Kaplowitz, 2009). In his paper *Constructing the Cafe University: Teaching and Learning on the Digital Frontier*, Cornel J. Reinhart of the Center for eLearning and eLiteracy in Mooers, New York, looks at the role digital technologies in active and student-centered learning (Reinhart, 2008). Although Reinhart's paper does not specifically address libraries and information literacy, it contains a history of the development of digital and interactive technologies in higher education and discusses the potential impact on higher education. He also provides a brief history of the emergence of the western university, offering a context for the dramatic changes at colleges and universities in the past 15 years that have been caused by a better understanding of the psychology of learning and the advent of digital technologies. Reinhart's article provides a solid background from which to consider digital technologies and services for ILI.

Digital natives and IL

Before making decisions about what technology could be effective for information

literacy instruction of digital natives, it is important to understand the most-recent research regarding the Google Generations' IL skills, as well as those of emerging adults. It should go without saying that librarians' goal is for their students to meet the Information Literacy Competency Standards for Higher Education set forth by the Association of College and Research Libraries (2000).

Possibly the best-known research on digital natives information literacy is the 2008 longitudinal study commissioned by the British Library and the United Kingdom's Joint Information Systems Committee (JISC). The researchers studied children born after 1993. Among the questions researchers sought to answer was whether the digital natives' information-seeking behavior was affected by their use of the internet and whether this would impact their future behavior as adults conducting scholarly research. This study, called *The Google Generation: Information Behaviour of the Researcher of the Future* was first issued as a report on the JISC web site (Rowlands et al., 2008a) and then an edited version was published several months later in *Aslib Proceedings* (Rowlands et al., 2008b). The results indicate that although the young people exhibit facility with online technology, they rely on search engines. They also skim or view information, rather than read it. The digital natives in the study also lacked critical and analytical skills needed to evaluate the information they found online (Rowlands et al., 2008a). This study is formative in the amount of information it offers about the Google Generation and their IL skills and for the myths that it exposes about digital natives, including the inaccurate belief that young people do not value the written word. One important finding was researchers discovered that online technologies have shaped the information-seeking behavior of all users, not just those born after 1993. Web users of all ages are impatient and bounce from page view to page view (Rowlands et al., 2008a). Although not peer-reviewed, the results published in the

online report's executive summary

(<http://www.ucl.ac.uk/infostudies/research/ciber/downloads/ggexecutive.pdf>) are extremely easy to understand because of the true-false format used by researchers' to present their findings about the Google Generation. Each question investigated is detailed with a breakdown of their data and analysis and the researchers' confidence level of each specific finding. The executive summary would be very useful to librarians who have little time to plow through peer-reviewed journals. This is important information for librarians at public libraries, public schools, and community colleges who are or will be working with the Google Generation. However, the *Aslib Proceedings* paper offers a much more in-depth discussion of the implications of the survey's findings for libraries (Rowlands et al., 2008b), and this information is important for policymakers, library and curriculum directors, and anyone planning for a library's future or lobbying for funding for ILI or library technology.

Another in-depth and comprehensive analysis of the research that has been conducted internationally on the Google Generation' information-seeking behavior is Barrie Gunter, Ian Rowlands, and David Nicholas's *The Google Generation: Are ICT Innovations Changing Information-Seeking behaviour?* [sic] (2009). The authors, who also were key researchers in the British Library study, assess the results and quality of the research that into IL issues surrounding the digital natives. The three authors explore the research and claims of other authors looking at digital natives' information literacy skills and consider whether there is evidence to support the conclusions in the other research. The authors also present and discuss their own research and discuss the impact that the Google Generation will have on scholarship and research in higher education, such as using information technology for collaborative research and potential changes in citation patterns, and the implications that behavior will have for librarians and libraries

(Gunter, Rowlands, & Nicholas, 2009). This resource offers a very broad and comprehensive analysis of the research on the Google Generation's information seeking behavior and discusses possible implications, including easy-to-understand critiques of research that have made some of the more alarming claims about digital natives' IL skills. Like the British study, this book dispels some of the myths about the Google Generation's IL skills.

In the United States, Project Information Literacy (<http://projectinfo.org/>) at the University of Washington's Information School, Seattle, WA, is one of the leaders of research of college-aged adults' information literacy skills. The project's leaders have focused on answering questions about how digital natives conduct research for both everyday information needs and for their college coursework. Project Information Literacy has conducted annual surveys for the past few years with the goal of growing their project into a nationwide study of college students' seeking and evaluating information for their classes and for "everyday" life (Head & Eisenberg, 2010, November, para 2). The project is headed by the iSchool's Dean Emeritus and Professor Michael Eisenberg, who co-developed the Big6 Model used to teach information literacy, and University of Washington researcher Alison J. Head, who conceived the survey in 2007 while teaching New Media at Saint Mary's College of California, a Catholic institution in Moraga, CA. Project Information Literacy seeks to explore how emerging adults "resolve issues of credibility, authority, relevance, and currency in the digital age" when it comes to seeking information for their "course work and everyday life" (Head & Eisenberg, 2010, November, para 2). Head and Eisenberg issue progress reports online once or twice a year and they published regularly in the professional literature on the discoveries they have made during the course of their research. One such peer-reviewed paper discussed the finding that a number of college students use *Wikipedia* to obtain background information to help them narrow research topics before diving into

scholarly research. Although interesting, *Wikipedia* use study does not have a proportionately large enough sample to allow Head and Eisenberg to make generalizations about college students' use of *Wikipedia* (Head & Eisenberg, 2010, March).

Most recently, Project Information Literacy Progress Report: Truth Be Told: How College Students Evaluate and Use Information In the Digital Age detailed responses from more than 8,350 students at 25 college campus to a survey looking at their information seeking and evaluating behaviors revealed that 77 percent and 67 percent of students responding took little at face value when evaluating information on the internet at in the library, respectively. Although emerging adults have the reputation of being avid technology users, the survey also revealed that many respondents lack the ability to frame questions that would aid their searches. That said, the researchers found that students intentionally limit their searches to handle the “staggering amount of information” available and approach research in a thoughtful, consistent, but limited, manner (Head & Eisenberg, 2010, November, p 35). Many of the college students responding to the survey indicated that they depended on research skills learned in high school -- a finding that has implications for secondary instructors and librarians, especially considering cuts to public education budgets in recent years. The survey results prompted Head and Eisenberg to make four recommendations in terms of higher education IL instruction: 1) integrating research rubrics into assignments; 2) focusing on research process, rather than library resources, when librarians conduct information literacy instruction; 3) collaborating with instructors to hold students more accountable for their research; and 4) assessing student preparation for employment to close the gap between what is used in the academic setting and what is used in the workplace.

Meeting the natives

Once armed with knowledge of how digital technologies fit with constructivist thought

and a better understanding of college-aged digital natives IL skills, librarians must determine what digital tools will best help them in the natives' cyber turf. Fortunately, there are several academic librarians and instructors who have used digital and online technology to deliver or supplement information literacy lessons with mixed results in regard to capturing students' attention and impacting ILI. These technologies included photo-sharing services, online gaming, information portals, blogging, and social networks.

In *Digital Nature and Digital Nurture: Libraries, Learning and the Digital Native*, Michael Robinson of the Hong Kong Institute of Education lays out the groundwork for understanding the role of digital technology in library instruction over the past 10 years. He also proposes that libraries should consider the ways in which they can appeal to students and focus on developing services that aid students' ability to find information, including improvements to the virtual library (Robinson, 2008).

Although not specifically focused on the information literacy instruction of digital natives, *Information Literacy and Web 2.0: Is It Just Hype?* by Peter Godwin of the University of Bedfordshire, Luton, United Kingdom, offers an overview of the peer-reviewed literature published between 2006 and 2008 and looks at the use of Web 2.0 tools for IL instruction. Godwin discusses in the different Web 2.0 tools and makes suggestions on which tools would be best for active learning, collaboration, visual learning, and other instructional situations. Additionally, Godwin also discusses research findings on the Google Generation's critical thinking and searching skills and compares them to other generations, a valuable perspective that may help dispel some myths that have been bandied about in the popular media (Godwin, 2009).

Priscilla Coulter and Lani Draper of Stephen F. Austin State University in Nacogdoches, Texas, describe in their paper *Blogging It Into Them: Weblogs in Information Literacy*

Instruction (2006) their attempt to use blogs to encourage students to dialog and reflect on their search strategies. Ultimately, the two researchers found that “at best” their effort to encourage students to blog about IL was a “neutral effort” (Coulter & Draper, 2006, p 108). Still, their lack of success, as well as their literature review that discusses surveys about blogging in academic instruction, provides invaluable information to other librarians who seek to incorporate blogs into IL instruction. Knowing what does not work may provide valuable guidance for librarians who seek to design effective lessons using blogs.

A librarian at Rice University in Houston, Texas, and another at Purdue University in Lafayette, Indiana, offer a new twist on web-based information portals used by many academic subject librarians. Since Debra Kolah of Fondren Library at Rice and Michael Fosmire of Purdue University Libraries found that the off-the-shelf portals, such as LibGuides, were limited to what librarians post, they sought technology that was interactive, affordable, and easy-to-use and found PageFlakes and NetVibes. Collaborating with science teachers, Kolah and Fosmire, who are both science subject librarians, asked students in two science classes to use PageFlakes and NetVibes to create their own online research guides, grading the results.

Kolah and Fosmire’s paper *Information Portals: A New Tool for Teaching Information Literacy Skills* details their efforts. At Rice, graduate students in physics used PageFlakes to create portals that would help them keep up-to-date on the latest scientific research and the search strategies for the resources they needed for other class assignments. At Purdue, undergraduates enrolled in a class exploring the impact of science on society and vice-versa were divided into teams to track new developments in science and science in the popular media using PageFlakes. The students also used Really Simple Syndication (RSS), an online program that allows people to aggregate updates to websites and online databases, from the professional

literature and popular publications and created searches for scholarly material related to their course work (Kolah & Fosmire, 2010). Although Kolah and Fosmire offer an extremely valuable tool to help students develop information literacy and research skills, they found no significant correlation between the grades on the students' information portal assignments and their final assignments in the classes where the portal work was done. The authors hope that in subsequent terms their collaboration with the instructors will allow for the portal assignment to be further integrated to the coursework. Kolah and Fosmire's use of PageFlakes may be among the most constructivist-oriented of digital technology in ILI covered in this literature review. Librarians who work with information portals should keep abreast of the professional literature in case Kolah and Fosmire publish results from additional use of digital programs in an ILI context.

Librarians Kaila Bussert, Nichole E. Brown, and Alison H. Armstrong while working at The American University in Cairo used the photo-sharing website Flickr to teach students about database searching and classification. The Flickr lessons were considered so successful that the librarians at The American University modified their IL course to use Web 2.0 tools including social bookmarking sites, social networks, folksonomy, blog aggregators and Really Simple Syndication (RSS). Their paper *IL 2.0 at The American University in Cairo: Flickr in the Classroom* offers instructional librarians more than ideas. They detail a series of questions that librarians should consider when evaluating web-based tools and websites for instructional use (Bussert, Brown, & Armstrong, 2008). The drawback to this paper is the data published makes it difficult to evaluate by the standards that the librarians determined the first Flickr class a success.

In his paper *Using Wikipedia to Teach Information Literacy*, Eric Jennings, a reference and instruction librarian at the University of Wisconsin-Eau Claire, encourages librarians to use to *Wikipedia* to teach students critical thinking skills (Jennings, 2008). Given the findings on

college students' use of *Wikipedia* to get background information on a topic (Head and Eisenberg, 2010a), this author believes using *Wikipedia* to teach students to evaluate information would aid IL instruction, especially in regards to students' ability to determine whether an entry is comprehensive, unbiased, and consider the authority of the authors.

Justine Martin and Robert Ewing's paper *Power Up! Using Digital Gaming Techniques to Enhance Library Instruction* is a must read for any academic librarian seeking to understand video game players, who make up 70 percent of college students. Martin and Ewing describe the parallels between the information retrieval processes and playing digital games (Martin & Ewing, 2008). At the very least, this paper gives librarians a vocabulary that might help them bridge vocabulary divide between digital natives and migrants, especially for one-shot lessons or point-of-service instruction. The information in this article (and perhaps some time spent participating in online gaming) could be used by a creative librarian to create visual and metaphorical IL lessons. Ameet Doshi's short column *How Gaming Could Improve Information Literacy* (2006) is not peer reviewed but it offers a list of resources and hyperlinks. However, the list is at least four years old, making it somewhat dated considering how quickly digital technology and services change.

For an understanding of how an extremely basic interactive computer game might replace a one-shot lecture, read Mary J. Snyder Broussard's *Secret Agents in the Library: Integrating Virtual and Physical Games in a Small Academic Library* (2010). At Lycoming College -- a small private liberal arts college in Williamsport, PA -- three freshmen composition classes were given a computer-based game, instead of the traditional lecture on information literacy. To complete the game, they had to physically interact with library materials to participate in the game. The game, which pitted the gamer against "spies" in the library in a race to find

information, was created by one of the librarians using multimedia software and the library's web site (<http://www.lycoming.edu/library/instruction/secretagent.html>). At least 88 percent of students in the three participating classes scored 100 percent in the game (Broussard, 2010). There is no data to indicate whether performance on the game correlated to grades in a class. Another concern about the Lycoming study is that 99 percent of the students are full-time and 93 percent are white (Broussard, 2010), and it remains to be seen how this approach might work among students who attend part-time or are from traditionally disenfranchised groups, such as the poor or minorities, who may not have the same exposure to online technology as their white peers do. More research is needed, perhaps at an urban and more diverse academic institution, such as a community college. Additionally, not every library has librarians with the time or technical aptitude to create such a game. Also, at the very small Lycoming College, librarians there found that even in the three classes where they tested the game, instructors requested that the game be tailored for their coursework, an issue that could increase exponentially at a mid-sized or larger institution. Finally, this author found the game cute but unsophisticated and that could impact the game's reception by digital natives who are accustomed to extremely complex digital games. Librarians might find their time better spent adapting lessons using gamer vocabulary to create metaphors, rather than trying to create an online game. It may be that metaphors using digital gaming vocabulary would help create a context for IL instruction.

For a sense of how a more sophisticated game would work for ILI, read Karen Markey, Fritz Swanson, Andrea Jenkins, Brian J. Jennings, Beth St. Jean, Victor Rosenberg, Xingxing Yao, and Robert L. Frost's paper *Designing and Testing a Web-Based Board Game for Teaching Information Literacy Skills and Concepts*. The eight researchers, librarians, and information technology specialists at the University of Michigan's School of Information designed a

sophisticated board game that is played online to help students' with information literacy skills. Their paper details the development and the first term of use of the game that was played by 49 of 75 undergraduate students. The game's premise is players must use what they find from library research to defend a town in the Middle Ages from the bubonic plague. Their paper discusses aspects of the game that worked and did not in terms of information literacy instruction. The authors found that students improved their knowledge of the Black Plague and increased their information literacy skills. One pitfall of the game, which was played for extra credit, was at times players were "lackadaisical" and some students guessed at answers rather than pausing in their online play to travel to the physical library to look up information required by the game (Markey et al., 2008, p 673). It remains to be seen whether students' interest in the game would increase if the game was required as part of a class. Like the spy game in Broussard's paper, it remains to be seen whether this game's performance as an IL tool would be affective when tested on a larger samples of students or tied to a course's grade.

Another method of teaching IL with digital tools is creating podcasts, short recordings that can be downloaded and played on portable digital media players such as an Apple iPod. Podcasts are considered convenient for students with limited time because they can be played while working out or driving and considered helpful for students who learn by listening (Berk et al., 2007). At the Curtin University Library in Perth Australia, Jaya Berk, Sonja Olsen, Jody Atkinson, and Joanne Comerford experimented with weekly podcasts that featured basic information about the library and about information literacy. Their paper *Innovation in a Podshell: Bringing Information Literacy into the World of Podcasting* offers a discussion of the technical issues associated with podcasting, ranging from finding a place to record, selecting equipment, and choosing software (Berk et al., 2007). Although the paper offers statistics on the

number of times the library's podcasts were downloaded, the authors did not conduct research to determine whether the podcasts aided information literacy instruction or whether they changed students' attitudes about the library. This paper points out the technical issues that librarians seeking to podcast would need to work through but more research is needed to determine whether the podcast lessons aided ILI.

Conclusion

The above literature review discusses only a fraction of the many options available for a librarian or any other educator seeking to shape information literacy lessons to be more appealing and more meaningful to the digital natives who are coming of age. Much of the instructional ideas and research contained in this literature review could be germinated to produce further research and future classroom innovations. This author believes that a number of the instructional methods using digital technologies and research on the digital natives IL skills could be used to develop a set of best practices for the use of using digital tools in information literacy instruction of digital natives.

That said, librarians and IL instructors need to be aware that although this literature review touches on many of the important areas of research and some of the web-based digital tools that have been used in ILI, this area of research and the technology is constantly evolving, requiring librarians to be progressive with their instructional methods. Any use of this literature review needs to be with the understanding that digital services and products are constantly updated. The smart librarian and IL instructor will not only keep abreast of these ongoing developments in the digital world but also will continually evaluate these new tools with a mind to whether they could be applied effectively to information literacy instruction. Such evaluations would determine whether the existing digital technology or the current uses of digital tools will

remain effective and guide the way for future research about digital natives' information literacy skills.

References

- Association of College and Research Libraries. (2000). Information Literacy Competency Standards for Higher Education. Chicago: Association of College and Research Libraries.
- American Library Association, [Website]. Retrieved from:
<http://www.ala.org/ala/mgrps/divs/acrl/standards/standards.pdf>
- Berk, J.; Olsen, S.; Atkinson, J.; & Comerford, J. (2007). Innovation in a podshell: bringing information literacy into the world of podcasting. *The Electronic Library*, 25(4), pp 409-19.
- Broussard, M. J. S. (2010). Secret agents in the library: integrating virtual and physical games in a small academic library. *College & Undergraduate Libraries*, 17 (1), pp 20-30.
- Brualdi, A. (1998). Multiple intelligences: Gardner's theory. *Teacher Librarian*, 26(2).
- Bussert, K.; Brown, N. E.; & Armstrong, A. H. (2008). IL 2.0 at The American University in Cairo: "Flickr" in the classroom. *Internet Reference Services Quarterly*, 13(1), pp 1-13.
- Coulter, P.; & Draper, L. (2006). Blogging it into them: weblogs in information literacy instruction. *Journal of Library Administration*, 45(1/2), pp 101-15.
- Doshi, A. (2006). How gaming could improve information literacy. *Computers In Libraries*, 25(5), pp 14-17.
- Gibson, W. F. (1982). Burning chrome. *Omni*, July in Gibson, W. F. (1986). *Burning Chrome*, 20th ed. New York, N.Y.: Ace Books, pp 168-191.
- Godwin, P. (2009) Information literacy and Web 2.0: is it just hype? *Program: electronic library and information systems*, 43(3), 264-274. doi: 10.1108/00330330910978563
- Grassian, E. & Kaplowitz, J. (2009). *Information Literacy Instruction: Theory and Practice*. 2nd ed. New York, NY: Neal-Schuman.

Gunter, B.; Rowlands, I.; & Nicholas, D. (2009). *The Google generation: are ICT innovations changing information-seeking behaviour?* Oxford: England, Chandos Publishing.

Head, A. J. (2007). Beyond Google: how do students conduct academic research? *First Monday* 12(7). Retrieved from:

<http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1998/1873>

Head, A. J. & Eisenberg, M. B. (2009, February 4). Finding context: what today's college student say about conducting research in the Digital Age. Project Information Literacy Progress Report, [Web site]. Retrieved from:

http://projectinfolit.org/pdfs/PIL_ProgressReport_2_2009.pdf

Head, A. J. & Eisenberg, M. B. (2009, December 1). Lessons learned: how college students seek information in the Digital Age. Project Information Literacy First Year Report with Student Survey Findings, [Web site]. Retrieved from:

http://projectinfolit.org/pdfs/PIL_Fall2009_finalv_YR1_12_2009v2.pdf

Head, A. J. & Eisenberg, M. B. (2010a) How today's college students use Wikipedia for course-related research. *First Monday*, 15(3), [Web page]. Retrieved from:

<http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2830/2476>

Head, A. J. & Eisenberg, M. B. (2010, November 1). Project Information Literacy Progress Report: Truth be told: how college students evaluate and use information in the Digital Age. Project Information Literacy, [Web page]. Retrieved from:

http://projectinfolit.org/pdfs/PIL_Fall2010_Survey_FullReport1.pdf

Head, A. J. & Eisenberg, M. B. (2010, November 5a). Project Information Literacy, [Website].

Retrieved from: <http://projectinfolit.org/> on November 20, 2010.

Head, A. J. & Eisenberg, M. B. (2010, November 5b). About. Project Information Literacy,

- [Website]. Retrieved from: <http://projectinfolit.org/> on November 30, 2010.
- Hignite, M.; Margavio, T.M.; & Margavio, G. W. (2009) Information literacy assessment: moving beyond computer literacy. *College Student Journal*, 43(3), pp 812-21.
- Jennings, E. (2008). Using Wikipedia to teach information literacy. *College & Undergraduate Libraries*, 15(4), pp 432-7.
- Kolah, D., & Fosmire, M. (2010). Information portals: a new tool for teaching information literacy skills. *Issues in Science & Technology Librarianship*, 60(Winter), [Web site]. Retrieved from: <http://www.istl.org/10-winter/refereed1.html>
- Li, X.; Wang, Y.; Fu, L.; & Xu, M. (2009). The university library: incubation center of research innovation literacy. *The Electronic Library*, 27(4), pp 588-600.
- Markey, K.; Swanson, F.; Jenkins, A.; Jennings, B. J.; St. Jean, B.; Rosenberg, V.; Yao, X.; and Frost, R. L. (2008). Designing and testing a web-based board game for teaching information literacy skills and concepts. *Library Hi Tech*, 26(4), pp 663-81.
- Martin, J., & Ewing, R. (2008). Power up! using digital gaming techniques to enhance library instruction. *Internet Reference Services Quarterly*, 13(2/3), pp 209-25.
- Obama, B. (2009, October 1). National Information Literacy Awareness Month, 2009. White House, [Web site]. Retrieved from http://www.whitehouse.gov/assets/documents/2009literacy_prc_rel.pdf
- Prucher, J. (2007). *Brave new words: the Oxford dictionary of science fiction*. Oxford, England: Oxford University Press.
- Reinhart, C. J. (2008). Constructing the cafe university: teaching and learning on the digital frontier. *On the Horizon Volume*, 16(1).
- Robinson, M. (2008). Digital nature and digital nurture: libraries, learning and the digital native.

Library Management, 29(1/2), pp 67-76.

Roberts, G. (2005). Instructional technology that's hip high-tech. *Computers in Libraries*, 25(10), pp 26-8.

Rowlands, I.; Nicholas, D.; Williams, P.; Huntington, P.; Fieldhouse, M.; Gunter, B; Withey, R.; Jamali, H. R.; Dobrowolski, T.; and Tenopir, C. (2008) The Google generation: the information behaviour of the researcher of the future. *Aslib Proceedings*, 60(4), pp 290-310.

Rowlands, I.; Nicholas, D.; Huntington, P.; Gunter, B.; Withey, R.; Dobrowolski, T.; Tenopir, C.; Williams, P.; Fieldhouse, M.; and Jamali, H. (2008a). Information behaviour of the researcher of the future. JISC, [Web site]. Retrieved from:

<http://www.jisc.ac.uk/whatwedo/programmes/resourcediscovery/googlegen.aspx> and

<http://www.ucl.ac.uk/infostudies/research/ciber/downloads/ggexecutive.pdf>

Rowlands, I.; Nicholas, D.; Williams, P.; Huntington, P.; Fieldhouse, M.; Gunter, B; Withey, R.; Jamali, H. R.; Dobrowolski, T.; and Tenopir, C. (2008b) The Google generation: the information behaviour of the researcher of the future. *Aslib Proceedings*, 60(4), pp 290-310.

U.S. Census Bureau. (2004). U.S. interim projections by age, sex, race, and Hispanic origin.

Retrieved from:

<http://www.census.gov/population/www/projections/usinterimproj/natprojt02b.pdf>

U.S. Census Bureau. (2004). Projected population of the united states, by age and sex: 2000 to 2050. Retrieved from

<http://www.census.gov/population/www/projections/usinterimproj/natprojt02a.pdf>