EXAMINING ADOLESCENT INTERNET LITERACY PRACTICES: AN EXPLORATION OF RESEARCH METHODS

(ERGENLERDE İNTERNET OKURYAZARLIĞI UYGULAMALARININ İNCELENMESİ: ARAŞTIRMA YÖNTEMLERİNİN ARAŞTIRILMASI)

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ABSTRACT

Internet literacy is now recognized as critical to the social and economic development of a nation. School systems throughout the world are finding ways to develop students' internet literacy and to use the internet in meaningful ways to support student learning. However, implementation efforts are largely directed by top down policy and by findings from large scale surveys of internet usages. Improved curriculum and pedagogy also needs to be informed by highly focused, qualitative studies of the everyday internet practices of a country's youth. In this article, we illustrate the use of multiple qualitative research methods from a pilot study that can be used to gain in-depth observation about youth internet literacy and skills, as well as perspectives from students, parents and teachers about effective internet use in schools. These methods involve multiple tools including audio and video recording, and digital screen capturing. We conclude with suggestions for ways of improving the validity of findings about youth internet literacy, and consequently contributing to more informed educational implications.

Keywords: internet literacy, new literacies, research methods.

ÖZ

İnternet okuryazarlığı günümüzde bir ulusun sosyal ve ekonomik gelişmesi için oldukça önemlidir. Dünya genelinde eğitim sistemleri öğrencilerin internet okuryazarlığını geliştirmenin ve interneti öğrencilerin öğrenmelerini desteklemek için anlamlı bir şekilde kullanmanın yollarını aramaktadırlar. Ancak, uygulama çabaları yukarıdan aşağıya yapılanmış politikalarca ve internet kullanımı üzerine yapılan geniş çaplı araştırmalar tarafından yönlendirilmektedir. Gelişmiş müfredatın ve pedagojinin ülke gençlerinin günlük internet kullanımları üzerine yapılan nitel çalışmalar tarafından bilgilendirilmesi gereklidir. Bu makalede, gençlerin internet okuryazarlığı ve becerileri hakkında ayrıntılı gözlem yapabilmek için kullanılan pilot çalışmadaki çoklu nitel araştırma yöntemlerinin kullanımı ve bunun yanında öğrencilerin, ebeveynlerin ve öğretmenlerin okullarda internetin etkili kullanımı üzerine bakış açıları örneklendi. Bu yöntemler dijital görüntü alımının yanı sıra, işitsel ve görsel kayıtlardan oluşan çoklu araçları içerir. Çalışma, gençlerin internet okuryazarlığı hakkındaki bulguların geçerliğini arttıracak ve dolayısıyla eğitim uygulamalarına katkı sağlayacak önerilerle sonlandırdı.

Anahtar sözcükler: internet okuryazarlığı, yeni okuryazarlıklar, araştırma yöntemleri

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INTRODUCTION

Throughout the world, internet literacy, or knowing how to use the internet to build knowledge, is now recognized as critical to the social and economic development of a nation (Castell, 2000; Souter, 2010). Today's literacy abilities entail knowing how to find, evaluate, and use information from the burgeoning World Wide Web to learn. Twenty-first century literacy education programs must support these abilities (National Council of Teachers of English, 2008; NETS Project and Brook-Young, 2007; Partnership for 21st Century Learning Skills, 2009; UNESCO, 2008). Some of the literacies of the internet that are critical for learning are using search engines, reading and evaluating search results, reading and evaluating websites, selecting appropriate hyperlinks, recognizing current and reliable sources of information, comparing information across sources, deconstructing ideologies of information, and using publication tools to communicate information.

Despite differences in access and connectivity between parts of the world, education systems face a common challenge in providing instruction in internet literacy and designing effective instructional use of the web to support student learning. Top-down actions in the form of standards and policies are one means of expanding literacy education to include internet literacy. Improved curriculum and pedagogy should also be informed from the ground level. What are students' experiences with the internet in their everyday lives? What online inquiry practices are students using independently? What are students', teachers', and parents' beliefs about the role of the internet in schools? Such understandings are essential to building a coherent foundation of internet literacy education. In this article, we illustrate with our own pilot study how researchers can build such foundations for contemporary literacy programs. Specifically, we show how to develop portraits of youth online inquiry practices and identify internet literacy skills that warrant instructional attention in schools.

Internet Literacy and Learning

The meaning of literacy is continually changing over time, between cultures, and depending on the technological context in which it occurs (Leu, Kinzer, Coiro and Cammack, 2004). Today, the internet is becoming the prominent context of literacy in the world, and this context demands new abilities. These abilities are regarded as "new literacies" because they involve proficiencies beyond those used in print (Coiro & Dobler, 2007; Henry, 2006;

Leu, Zawilinski, Castek, Banerjee, Housand, Liu, & O'Neil, 2007; Sutherland-Smith, 2002).

As internet access increases, youth turn first to the internet for information. At the same time, the amount of information available on the internet is mushrooming and organization of this information is increasingly complex. All of this demands new skills and strategies in finding and using digital information. Competency in the new literacies of the internet is critical to being able to participate in global, networked societies because these "new literacies allow us to use the internet and other ICT's 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). In other words, internet literacy enables us to learn and to participate in knowledge production and dissemination.

We conducted our pilot study of adolescent internet literacy in Canada, which has one of the highest rates of internet connectivity in western countries (Internet World Statistics, 2000-2010). The background that we outline assumes differences in factors of internet literacy for researchers undertaking studies of youth internet literacy in other parts of the world.

A growing literature describes the changing literacy practices of "digital natives", or those born after 1991 (Buckingham, 2007; Ito, Horst, Bittanti, boyd, Herr-Stephenson, Lange, Robinson, 2008; Lenhart, Purcell, Smith & Zickuhr, 2010; Tapscott, 2009). This literature claims that today's youth are as comfortable with a computer screen as a book; spend more time on the internet than watching television; rely on Google to find information and Wikipedia to learn; and freely create, post and share photos, music, and videos. However, the universality of this profile is now questioned and more complex gradations of internet literacy among youth are being revealed (Hargittai & Walejko, 2008; Helpser & Enyon, 2010; Luckin, Clark, Graber, Logan, Mee & Oliver, 2009; Samuelsson, 2010).

Most important to our study is the fact that the internet as a learning environment is increasingly demanding. Students must be able to navigate through vast amounts of information, evaluate the usefulness and integrity of information, and integrate multiple sources of information. A recent report from the United Kingdom concluded that youth have "a desire for instant answers and a casual approach to critical evaluation, plagiarism, and information ownership—key issues which demand attention . . . from the education system" (Committee of Inquiry into the Changing Learning Experience, 2009, p. 23). Although today's students are savvy in many aspects of internet literacy, particularly for purposes

of socializing and entertainment, they are less proficient for purposes of learning (Chung & Neumann, 2007; Coiro & Dobler, 2007; Damico & Baildon, 2007a, 2007b; Dresang, 2005; Henry, 2006; Lawless, Shrader & Mayall, 2007; Shenton, 2007). This body of research shows that when presented with an information problem, adolescents rely on Google as their search engine and use natural language as search terms. This pattern indicates their limited understanding of the internet as a collection of resources from different providers and lack of knowledge of more effective keyword search strategies. They approach the results list with a "click and grab" strategy by most often selecting the first source with little review and evaluation of its relevance or quality. Students spend little time actually reading the source, and instead skim and scan, and become distracted by hyperlinks. They cut and paste rather than reword and compose notes. Their abilities to critically evaluate such basic qualities as the currency, authority, reliability, and bias of information are limited as they appear to accept most things on the internet as truth.

Although research has established a strong basis for the roles of schools in using the internet to learn and for teaching internet literacy skills, teachers and schools face multiple challenges in realizing these responsibilities. These challenges involve access to computers, time to add internet literacy to the already full curriculum, professional development to improve their own internet skills as well as gain teaching ideas, and administrative support to allow teachers to experiment with integrating the internet into learning (Cuban, 2001; Hennessey, Ruthven & Brindley, 2005; John & Sutherland, 2005; Madden, Ford, Miller & Levy, 2005). Another problem relates to current evolution of the world wide web, or web 2.0, and underlying assumptions about learning and knowledge in this new environment. Research is showing how the internet is used in schools to maintain old structures of knowledge and learning (O'Brien & Bauer, 2005; Warschauer, 2006), in contrast to practices inherent in current web 2.0 that "foreground(s) interactivity and collaboration around shared content" (Davies & Merchant, 2009, p. x). Even when students are given opportunities to use web 2.0 applications (e;g., wikis, blogs, social network sites) that allow collaborative, learner-centered knowledge production in school, their experience with traditional discourses of schooling can cause them to resist usage of alternative discourses in school settings (Grant, 2009; Leander, 2007).

Our pilot study was designed to explore research methods that would be used in a larger research program to extend the literature of internet literacy by a) examining how youth use the internet when they are doing school assignments at home; b) identifying the internet skills and strategies that youth need to be taught; and c) identifying recommendations for using the internet to improve learning.

METHODOLOGY

Educational researchers of internet literacy recommend that qualitative methodologies be more frequently employed (Burnett, 2009; Greenhow, Robelia & Hughes, 2009). Our pilot study explored the use of several methodologies including the use of two case studies to construct understandings of adolescents' internet literacy. Data sources consisted of: a) semi-structured interviews with case study students and their parents; b) observation in the form of digital visual capturing of the case study students' internet practices each time they did homework over a two-week period; c) recorded oral "think-aloud logs" of the case study students during each homework session; and d) focus groups: one with adolescent students and and one with teachers of adolescents.
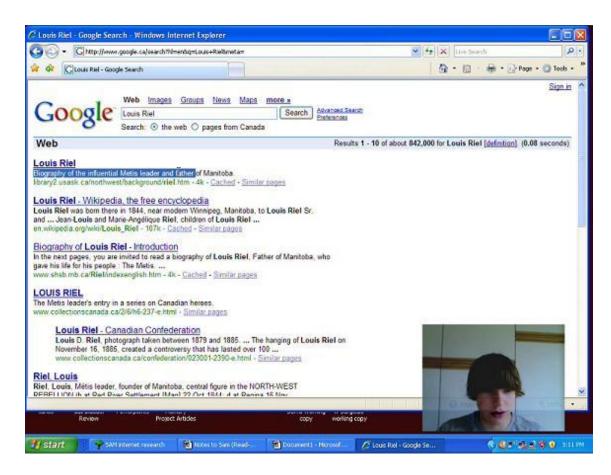
Our participants for the case studies were drawn from purposive sampling to ensure we worked with active internet users. An e-poster about the project was placed on our Faculty's listserv and parents of adolescents were invited to discuss participation with their children. Two families agreed to participate. Our case study students were Darren (male, age 15) and Nicole (female, age 12) (both names are pseudonyms) and both lived in a large urban area in western Canada. They each had home access to the internet and used the internet in their everyday lives. Interviews with Darren and Nicole and their parents were conducted near the end of the observation data collection period. Questions for the two students focussed on the technologies they used and their recommendations on ways of using technology to help them learn in school (see examples in Appendix A). Parent interviews addressed their views of how the internet helps learning, parental roles in their child's internet use, and use of the internet in school (see examples in Appendix B).

One focus group was conducted with five students ages 12 and 13 (grades 6 – 8) using the same questions used with the case study students (Appendix A). In the other focus group, four teachers and one administrator from the same middle school discussed types of technologies students regularly use in their classrooms, what it is about those technologies and the internet that engages students, and how student uses of these technologies (and the internet) in school might differ from out-of-school uses (see examples in Appendix C).

In the student focus group, participants were first given a pad of "sticky notes" and encouraged to write their thinking about the questions as it occurred to them. Each discussion question was written on a large piece of chart paper and these were spread around the room. Over a 20-minute period, students stuck their

notes on the appropriate pieces of chart paper. Then we led a discussion of each question referring to students' notes on the chart papers, guiding the discussion by grouping responses and asking students to clarify and extend their responses. To free the researcher to be fully engaged with the participants and not be distracted by the task of recording observations, the focus groups were videotaped and transcribed later for analysis.

Much of the research about internet literacy has used surveys, self reports, and tests administered in laboratories with contrived tasks. To observe our case study students, we used screen capture software to obtain comprehensive and in-depth data about their internet practices while students did homework. Morae usability testing software (http://www.techsmith.com/morae.asp) captures audio, video, on-screen activity and keyboard/mouse input. Sessions can be later observed in real time and prepared for analyses with notes and by segmenting into meaningful units. Figure 1 shows a screen capture from the Morae data.

Figure 1. Morae Recording

We installed the Morae software on the home computers of the two case study students, and trained them in their homes how to use it and how to do a simultaneous think-aloud. We were sensitive to the possible issues of personal integrity with such young people. Students were given control of when they recorded themselves and were free to turn the software on and off at their discretion. This arrangement was approved by our ethical review board, and the students' parents and the students themselves signed consent forms. Students were given ample practice time both with the researchers and independently over several weeks. Once comfortable with the process, students were asked to record themselves anytime they did homework over two weeks.

Data Analysis

All interview and focus group data were transcribed. We also transcribed the case study students' think aloud logs. We coded the observation data captured by Morae software by number of: a) on and off task activities; b) searches conducted; c) websites visited; and d) internal links selected. We analyzed the data in various ways. For example, interview data from the case study students and their parents were used to construct portraits of each students' home and school experiences with the internet. In another article (Asselin & Moayeri, 2010), we provide a more detailed explanation of the use of Morae software for data collection, analysis and presentation; and report the accounts of our case study students' internet practices as captured by the screen capture software and think-aloud logs. These accounts along with the coded quantitative data were used to describe the students' internet literacy and learning practices based on the new literacies framework defined by Leu et al., 2004 and Leu et al. 2007: a) focusing and identifying purpose; b) searching for information,; c) analyzing information; and d) learning from information. In this article, we present samples of our analyses as a basis for discussing research methods for learning about internet literacy. We conclude by discussing what we learned from our pilot study about methods for studying internet literacy and suggest directions for further research.

In this paper, we highlight two ways we used the data: a) descriptive portraits of our case study students' experiences with the internet based on parent

and student interview data; and b) identification of the skills students need help with based on interview, focus group, and think-aloud data. In some instances, the same data is used in the portraits and in the identification of internet skills warranting instructional support.

Portraits of Learners: Nicole and Darren

Nicole began playing educational games on the family computer in preschool and learned to type with her father in grades 1 and 2. By grade 3 she was on the internet to "look up stuff about coyotes or whatever [she was] learning at school." She rates her internet skills as much better than her friends and is proud of her abilities to type fast and find information on Google quickly. She spends a lot of time on virtual pet websites like NeoPets, a behavior which her father describes as "an addiction . . . compared to other types of things she does on the computer."

Nicole dislikes "messenger sites" stating "I don't want to talk to weird people I don't even know." She appears to have been influenced by her parents' view of the internet as something "to be feared and respected . . . and [doesn't] appreciate the dark side with its access to predators and bullies." Nicole's mother noted positively that schools sent warnings about internet predators.

Nicole finds the internet particularly valuable for learning as "books take so long to go through. The internet is an easy way to get a ton of information really fast." In contrast, her mother prefers her to use books as she can monitor her better and she "would like (Nicole) to use the old Britannia set upstairs that is yet to be opened." Similarly, Nicole's father sees more value in books than the internet for gaining deep understanding about a subject.

Nicole rarely uses the internet at school. She avoids using the school computer lab because she is uncomfortable with the teacher and the classroom computers are too slow and always have lineups. Nicole has not observed or experienced much integrated use of computers in her middle school subjects.
Nicole was excited to share "one great site that (she) found. It's called Wikipedia.org and it's been really helpful." She is aware, however, that not every web site will be trustworthy and "you have to check other sites to make sure." She wishes teachers would recommend "reliable sites and tell [them] to avoid going to lesser known sites. They should make what they're saying simple and not techy." In Nicole's school, only the computer teacher talks about computers, she explained, and none of her classroom teachers use computers except one who made a special PowerPoint presentation. She recommends that "teachers (should) use technology for different and fun things."

Darren began using the internet when he was 10 years old and rates his abilities as equal to those of his friends. He uses the internet for communication, games, and leisure particularly surfing the web and participating in "mass player online games." He logs onto Facebook daily, has favorite websites, and enjoys forums. Web surfing for him is often exploratory and he wanders frequently and easily through websites which he accepts is not always the best strategy when trying to get schoolwork done. He sees the internet as having very limited use for school "because for most of the assignments, [he] can just get information straight out of the textbook." His mother observed the same trend of schools "remaining in a very traditional textbook mindset . . . under-using the internet a great deal." She recognized that her son "would do what his teachers wanted him to do without ever having to go on the Internet."

Like his mother, Darren sees enormous potential for using the internet to improve learning because "you can probably find everything you want to know." He is aware of issues of reliability and trustworthiness of information on the internet explaining that "anyone anywhere can set up a blog or other online tools and even a hoax website . . . and it's all just a Google search a way." He commented on the dangers of so much "opinion-based" information that is on the internet saying that "Wikipedia's a great source but it's all about people posting their ideas and opinions which sometimes aren't informationally intact."

Darren recommends that "teachers should be aware that kids have their own ideas on how to get information and should probably trust them." He explained that Facebook and social networking sites have interesting possibilities for improving learning especially in political subjects because "you can really see two different sides." His mother considered that social networking sites could be useful in carrying out group work projects in school by providing a communication centre.

Darren's use of the internet in school differs from how he uses it at home. He explained that his teachers generally do not give assignments that include the use of the internet because of concerns about unequal home access, thus learning in school is rooted in textbooks. When computers were first introduced in his schooling (grade 7), he was able to play games and use some basic social networking programs. However, blocks and firewalls are now installed on school computers for safety reasons, and also, "they don't want you goofing around. So now it's pretty much straight Google searching." His mother on the other hand was unaware of any school policies around internet usage.

Darren's mother expressed the view that "he needs to know how to access particular resources that are appropriate. He needs to know how to evaluate them and deal with them in ways perhaps that are a bit traditional . . . but applied to

new kinds of resources." Another instructional responsibility for schools that she identified was "taking them beyond Google . . . to help students explore different databases and then how to evaluate what they find there . . . and take notes, not cut and paste." She also felt strongly that schools needed to go beyond using paper and pencil assignments and instead design projects where students could show their learning in more creative ways made possible by available software and free programs on the internet.

Internet Literacy Skills Needing Instruction: Strategic Searching and Critical Evaluation

Despite their extensive use of the internet, Nicole and Darren lacked skills in many areas, particularly in locating information and critical evaluation of internet sources. Our case study students consistently began their information searches with Google (typing in www.google.com rather than accessing it from their toolbars), then entering a few keywords with no search markers. Wikipedia was frequently the first site to appear on their result list. They typically and rapidly selected the first hit and read a few lines at the top of each website, and moved onto other sites in seconds. Clip 1 (http://www.screencast.com/t/awJ0AEAk) shows Nicole using broad terms and everyday language to search on Google for a particular type of dog. Clip 2 (http://www.screencast.com/t/dmc45hL4Wxu) clearly demonstrates their rapid selection of search results from the top of the list. Clip 3 (http://www.screencast.com/t/jgQrq8ZhdS) shows Nicole rapidly skimming several sites consistently focusing on the top of the pages she selected. Thus the information search pattern was Google, select from top of hit list (frequently Wikipedia), skim the first lines, back click to the Google results, and move on to another result from the top of the hit list. This process is repeated until they either found their answer or tired of searching.

Observation data from Darren and Nicole showed that their primary criterion for evaluation of websites was whether it served their information search purpose. If the site contained just the topic they were looking for, they were satisfied. At no time did either student apply criteria that they were likely introduced to in school, such as currency, authority and validity. Neither did they ever compare sources on the topic, an important aspect of critical literacy. Clip 4 (http://www.screencast.com/t/LeiDm46xuS) shows Darren evaluating the usefulness of sites for his science assignment, but he finds the information too complex or too simple. He concludes that his textbook is the better source of information for this purpose.

The need for assistance in this area was echoed in student and parent interviews and in the student and teacher focus groups. One student in a focus group recognized the possibility of retrieving false information, but did not have the resources to solve the problem. He admitted that many websites may be good sources, but was unsure if he could trust the information. During the interviews with the case study students, they both spoke about their awareness of unreliable information on the internet. Both students noted they selected Wikipedia from a list of search results because "it's always a good place to start." Parents were concerned about their children accessing credible information and wanted them to be taught to "access particular resources that are appropriate."

Teachers in our focus group felt that all teachers were responsible in helping students to be critical users of online information. They were aware of students' tendency to Google search and "click and grab." They discouraged the use of Wikipedia except for one teacher who used it in a critical thinking lesson in which students were to "choose a topic, read the Wikipedia article, find something in it that's false or wrong. But as far as just straight off, using as a source for their research, no." One teacher explained how he "spent periods of time, just looking for sites and evaluating them and talking about what you look for on it. What on the web makes it credible, what doesn't make it credible? But ultimately, when they go home and do it, do they just click on anything?" The teachers agreed that providing pre-selected sites was the best practice as students are more productive than when left to independently search the web. This begs the question of how students will be taught to strategically search for and critically evaluate information sources.

DISCUSSION

Although our work is grounded in Canadian contexts of youth internet literacy and issues typical to our education systems, internet literacy plays a pivotal role in every country's future. The International Internet World Statistics reports that between 2008 and 2009, the percentage of world use of the internet rose from one-sixth to one-quarter (26.6%). The rate of uptake will be even higher and faster as access improves through the use of such technologies as satellite and fiber optics, and the rapid and widespread use of mobile devices. Vast gaps in penetration rates will likely remain to some degree. However, in parts of the world where until only recently internet access was unheard of, one now regularly sees wireless shopping areas and internet cafés primarily occupied by youth. These new literacy sites along with other service developments, such as

the eGranary Digital Library (http://www.widernet.org/eGranary/) and Open Library (http://openlibrary.org/), are transforming how people learn about the world. Ultimately, these developments challenge notions of learners as passive recipients and knowledge as fixed truths delivered by experts. These are the larger contexts and issues in which internet literacy and its place in supporting student learning need to be seen. Our work is one piece of this evolving educational landscape.

Reflections on our Research Methods

At the end of our pilot study, we agreed that our exploration of multiple research methods to learn about aspects of internet literacy was productive. In a short time, we gained a wealth of data with a modest sample of students, teachers, and parents. We could see how extending the study to a larger research sample would yield robust data and consequently, findings leading to meaningful implications for curriculum, instruction and integration of internet literacy in schools. We were particularly pleased with the think-aloud data that greatly enriched the observation data captured by Morae software. It takes time to install, train, and practice with this software and for the students to be comfortable thinking aloud. A think-aloud protocol for the students would have been helpful. Darren was quite articulate and Nicole less so, but that could be a developmental or personal comfort matter. However, the power of think-aloud data with the Morae recordings is significant. We are particularly interested in continuing to explore new methodological tools such as Morae to gain more in-depth and accurate understanding of youth internet literacy. From our pilot study, we feel there is great potential in using such innovations alongside more traditional methods such as interviews and document collection (such as student projects, assignments, school district policy on the internet).

We recognized that we needed to know more about the context of the homework tasks that Nicole and Darren were working on, but we had not arranged ethical permission to include their own teachers in the study. Additionally, we felt we had an incomplete picture of students' internet literacy as our observations were limited to what they chose to do in homework assignments. When designing the study, we assumed students would use the internet more frequently and liberally for school work when doing it at home. What we found was that one, using the internet was not necessary to complete their school work; and two, when students did use the internet for their school work, their uses appeared bound by the closed nature of the tasks. School tasks, whether done at home or in school, seemed to be structured to constrain internet usage to traditional notions of learning (authority driven, knowledge as showing).

Our case study students also appeared to resist altering these discourses even if given opportunities (Grant, 2009). For example, like Luckin et al. (2009), we found that students used Wikipedia to get information, but they did not log in to add or edit information. We suggest that future research examine both structured tasks as well as self-selected tasks with the internet.

Toward an Expanded View of Internet Literacy

Data from our pilot study align with other research about typical ways that youth search and navigate online information (Coiro & Dobler, 2007; Henry, 2006; Rowlands & Nicholas, 2008; Shenton, 2007). We anticipate that studies conducted in other contexts would also identify a range of internet literacy practices, particularly "operational" and "critical" literacies (Damico & Baildon, 2007b) that should be addressed in instruction. Our data also suggest the need for research about how schools are attending to the social, economic, and ideological dimensions of the internet (Fabos, 2008; Kapitzke, 2005). Such an agenda is challenged by conservative tendencies of schooling in which control over texts, tasks, and assessment remain the norm. Ultimately, we must recognize that the internet—and its infinite iterations and transformations—is here to stay even in the face of new web developments, and that young people will inhabit these worlds with or without acknowledgement in schools. The crucial role of schools in the world of the evolving web is not only to use it to engage students and support their learning, but to guide students in ethical and socially responsible use of the increasingly complex and global worlds of the web.

Literacy is continuing to evolve with rapidly changing technologies such as Web 2.0 and the semantic web. Widely practiced behaviors such as googling, tagging, and social networking are forcing libraries to move to "one search," enable users to locate information with personal tags, and create a presence on Facebook and other such sites. Changes in the ways that multimodal web content (sounds, words, images, etc.) is now constantly borrowed, reassembled, transformed and retransformed signal shifts from assumptions underlying the "old web" to those of the "new web" such democratization of knowledge, learning ecologies, and participatory cultures (Jenkins, 2006; Lankshear & Knobel, 2006).

Our research focuses on internet literacy, and the changing nature of literacy as the web evolves into more user-based environments. However, we are also deeply concerned about the widening "participation gap" (Hargittai & Walejko, 2008; Helsper & Enyon, 2010). Exclusion from opportunities to contribute to the networked society is "one of the most damaging forms of exclusion in the economy and culture" (Castells, 2002, p. 3). Research methods in our pilot study of internet literacy can be applied to learning about the

participatory literacies of youth and ways that schools can help level the playing field. Learning more about the literacy processes used to construct and transform knowledge, and learning which aspects of these processes adolescents need help with are two ways of moving a nation's schools toward a knowledge-building culture.

REFERENCES

Asselin, M., & Moayeri, M. (2010). New tools for new literacies research: An exploration of usability testing software. *International Journal of Research and Method in Education*, *33*(1), 41–53.

Buckingham, D. (2007). *The media literacy of children and young people*. London: Centre for Study of Children. Retrieved from **http://www.ofcom.org.uk/advice/media_literacy/medlitpub/medlitpubrss/ml_children.pdf**.

Burnett, C. (2009). Research into literacy and technology in primary classrooms: an exploration of understandings generated by recent studies. *Journal of Research in Reading*, *32*(1), 22-37.

Castells, M. (2002*). The internet galaxy: Reflections on the internet, business and society*. Oxford: Oxford University Press.

Castells, M. (2000). *The rise of the networked society* (2nd ed.). Oxford: Blackwell.

Chung, J.S., & Neumann, D. (2007). High school students' information seeking and use for class projects. *Journal of the American Society for Information Science and Technology, 58*(10), 1503–1517.

Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the internet. *Reading Research Quarterly, 42*(2), 214–257.

Committee of Inquiry into the Changing Learning Experience. (2009). *Higher education in a Web 2.0 world: Report of an independent committee of inquiry into the impact on higher education of students' widespread use of Web 2.0 technologies*. Retrieved from http://www.clex.org.uk.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.

Damico, J., & Baildon, M. (2007a). Reading web sites in an inquiry-based social studies classroom. In D. Row, R. Jimenez, D. Compton, D. Dickenson Y. Kim, K. Leander & V. Risko (Eds.), *56th yearbook of the National*

Reading Conference (204–217). Oak Creek, WI: National Reading Association.

Damico, J., & Baildon, M. (2007b). Examining ways readers engage with websites during think-aloud sessions. *Journal of Adolescent & Adult Literacy, 51*(3), 254–263.

Davies, J., & Merchant, G. (2009). *Web 2.0 for schools: Learning and social participation*. New York: Peter Lang.

Dresang, E.T. (2005). The information seeking behavior of youth in a digital environment. *Library Trends, 54*(2), 178–196.

Fabos, B. (2008). The price of information: Critical literacy, education, and today's internet. In J. Coiro, M. Knobel, C. Lankshear & D. Leu (Eds.), *Handbook of research on new literacies* (pp. 839–870). New York: Lawrence Erlbaum.

Grant, L. (2009). 'I DON'T CARE DO UR OWN PAGE!' A case study of using wikis for collaborative work in a UK secondary school. *Learning, Media and Technology*, *34*(2), 105–117.

Greenhow, C., Robelia, B., & Hughes, J. (2009). Web 2.0 and classroom research: What path should we take now? *Educational Researcher, 38*(4), 246–259.

Hargittai, E., & Walejko, G. (2008). The participation divide: Content creation and sharing in the digital age. *Information, Communication & Society, 11*(2), 239–256.

Hennessy, S., Ruthven, K., & Brindley, S. (2005). Teacher perspectives on integrating ICT into subject teaching: Commitment, constraints, caution, and change. *Journal of Curriculum Studies, 37*(2), 155–192.

Helsper, E. & Eynon, R. (2010). Digital natives: Where is the evidence? *British Educational Research Journal, 36* (3), 503 - 520

Henry, L.A. (2006). SEARCHing for an answer: The critical role of new literacies while reading on the internet. *The Reading Teacher, 59*(7), 614–627.

Internet World Statistics: The internet Big Picture. (2000-1010). *Usage and Population*. Retrieved from http://www.internetworldstats.com/stats.htm

Ito, M., Horst, H., Bittanti, M., boyd, d., Herr-Stephenson, B., Lange, P.G., Robinson, L. (2008). *Living and learning with new media: Summary of findings from the digital youth project*. The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning. Retrieved from http://digitalyouth.ischool.berkeley.edu/files/report/digitalyouth-WhitePaper.pdf.

Jenkins, H. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. John D. and Catherine T. MacArthur

Foundation: Chicago, IL. Retrieved from
http:/digitalyouth.ischool.berkeley.edu/report.

John, P., & Sutherland, R. (2005). Affordance, opportunity and the pedagogical implications of ICT. *Educational Review, 57*(4), 405 - 413.

Kapitzke, C. (2005). Whose community? Which knowledge? A critical (hyperliteracies) take on information literate school communities. In J. Henri & M. Asselin (Eds.), *The information literate school community: Issues of leadership* (pp. 27–37). Westport, CT: Libraries Unlimited.

Lankshear, C., & Knobel, M. (2006). *New literacies: Everyday practices and classroom learning* (2nd ed.). Philadelphia: Open University Press.

Lawless, K., Shrader, P., & Mayall, H. (2007). Acquisition of online information: Knowledge, navigation and learning outcomes. *Journal of Literacy Research, 39*(3), 289–306.

Leander, K. (2007). "You won't be needing your laptops today:" Wired bodies in the wireless classroom. In M. Knobel & C. Lankshear (Eds.), *A new literacies sampler* (pp. 25–48). New York: Peter Lang.

Lenhart, A., Purcell, K., Smith A., & Zickuhr, K. (2010). *Social Media and Young Adults*. Pew internet and American Life Project, Washington, DC. Retrieved from **http://www.pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx**.

Leu, D.J., Zawilinski, L., Castek, J., Banerjee, J., Housand, B., Liu, Y., & O'Neil, M. (2007). What is new about the new literacies of online reading comprehension? In A. Berger, L. Rush, & J. Eakle (Eds.), *Secondary school reading and writing: What research reveals for classroom practices* (pp.37-68). NCTE/NCRLL: Chicago, IL. Retrieved from http://www.ncte.org/library/files/Store/Books/Sample/42936Chap03_x.pdf

Leu, D.J., Kinzer, C.K., Coiro, J., & Cammack, D. (2004). Toward a theory of new literacies emerging from the internet and other information and communication technologies. In R. B. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed.) (pp. 1568-1611). Newark, DE: International Reading Association.

Luckin, R., Clark, W., Graber, R., Logan, K., Mee A., & Oliver, M. (2009). Do web 2.0 tools really open the door to learning: Perceptions, practices and profiles of 11–16 year old students. *Learning, Media and Technology*, *34*(2), 87–104.

Madden, A., Ford, N., Miller, D., & Levy, P. (2005). Using the internet in teaching: The views of practitioners. *British Journal of Technology, 36*,

255–280.

National Council of Teachers of English. (2008). *The NCTE definition of 21st century literacies*. A position statement of the NCTE Executive Committee. Retrieved from http://www.ncte.org/positions/statements/21stcentdefinition

NETS Project & Brook-Young, S. (2007). *National educational technology standards for students* (2nd ed.). International Society for Technology in Education.

O'Brien, D.G., & Bauer, E.B. (2005). New literacies and the institution of old learning. *Reading Research Quarterly*, *40*(1), 120–131.

Organisation for Economic Co-operation and Development. (2005). *Are students ready for a technology-rich world? What PISA studies tell us*. Retrieved from http://www.oecd.org/document/31/0,2340,en_32252351_ 32236173_35995743_1_1_1_1,00.html.

Partnership for 21st Century Learning. (2009). *Framework for 21st century learning*. Retrieved from http://www.21stcenturyskills.org/index.php.

Rowlands, I., & Nicholas, D. (2008). *Information behaviour of the researcher of the future*. A CIBER Briefing Paper. Commissioned by British Library & Joint Information Systems Committee. Centre for Information Behaviour & the Evaluation of Research (CIBER), University College London. Retrieved from http://www.bl.uk/news/pdf/googlegen.pdf.

Samuelsson, U. (2010). ICT use among Swedish 13-year old children. *Learning, Media and Technology*, *35*(1), 15–30.

Shenton, A.K. (2007). The paradoxical world of young people's information behaviour. *School Libraries Worldwide, 13*(2). Retrieved from http://www.iasl-online.org/pubs/slw/july07-shenton.htm.

Souter, D. (2010). Towards inclusive knowledge societies. Paris: UNESCO. Retrieved from: http://unesdoc.unesco.org/images/0018/001878/187832e.pdf.

Sutherland-Smith, W. (2002). Weaving the literacy Web: Changes in reading from page to screen. *The Reading Teacher*, 55, 662–669.

Tapscott, D. (2009). *Grown up digital: How the net generation is changing your world*. Toronto: McGraw Hill.

UNESCO (2008). *UNESCO ICT standards for teachers*. Retrieved from http://portal.unesco.org/ci/en/ev.php-URL_ID=25740&URL_DO= DO_TOPIC&URL_SECTION=201.html.

Warschauer, M. (2006*). Laptops and Literacy: Learning in the Wireless*

Classroom. New York: Teachers College Press.

APPENDICES

Sample Interview and Focus Group Questions

Appendix A
Sample Student Questions: Case Study Interviews and Student Focus Groups
1. How would you rate your skill level with using the internet? Compared to your friends? Other people your age?
2. Tell us about what kinds of technology you regularly use in everyday (out-of-school) life and the purposes you use them for.
3. What is it about these technologies that make them such a part of your everyday life? What is it about the internet that makes it a regular part of your life?
4. Describe the ways that you use the internet at home compared to how you use it at school.
5. What recommendations do you have for teachers about ways to use the internet (and technologies that have internet access) that would help you learn what you have to learn in school?

Appendix B
Sample Questions for Parents of Case Study Students
1. What do you believe about the value of the internet in helping your child a) to learn generally, and b) to learn school subjects?
2. What is your role as a parent in your child's use of the internet?
3. What have you observed about your child's school internet policies? About the ways your child uses the internet in school?
4. What recommendations do you have for schools concerning the use of the internet in supporting student learning of school subjects?

Appendix C
Sample Questions for Teacher Focus Groups
1. What do you believe about the value of the internet in helping students a) to learn generally, and b) to learn school subjects?
2. Tell me about the ways you have your students use the internet to support their learning of the curriculum.

3. What challenges do educators face in integrating the internet into teaching the curriculum?