Looking at literacy through the prism of information

By Carol A. Gordon

Man the food-gatherer reappears incongruously as information-gatherer.
Marshall McLuhan

Moving from an oral to written tradition

It is difficult to imagine a time when most people could not read. They learned in the oral tradition without benefit of a written language that enables re-reading, revising, and re-interpreting text. Storytelling served to entertain and to educate people about the past. Information was malleable and dynamic, without verification or even authority. Information sharing was a communal event, powered by the spoken, rather than the written word. In a study of an illiterate society the researcher asked a female member of the society to describe a tree that was plainly in sight. She was bewildered by the request. "It's right in front of you," she replied. "You can see what it looks like" (Gleick, 2011). She saw no purpose for using words in a symbolic way when an image could instantly convey definition and meaning. Clearly, her oral tradition shaped the way she viewed language and the world.

It is tempting to speculate that it was the invention of the printing press that moved society from an oral to a written tradition. In his recently published book, *The Information: A History, A Theory, A Flood*, James Gleick looks at the central role information plays in revolutionising the way people think and communicate. He would disagree with the premise that the printing press created a literate society. Instead Gleick (2011) sees the discovery of an alphabet to be the founding technology for the emergence of literacy:

> *The telephone, the fax machine, the calculator, and, ultimately, the computer are only the latest innovations devised for saving, manipulating, and communicating knowledge. Our culture has absorbed a working vocabulary for these useful inventions. We speak of compressing data, aware that this is quite different from compressing gas. We know about streaming information, parsing it, sorting, it matching it, and filtering it. Our furniture includes iPods and plasma displays, our skills include texting and Googling, we are endowed, we are expert, so we see information in the foreground. But it has always been there. It pervaded our ancestors' world too, taking forms from solid to ethereal, granite gravestones and the whispers of courtiers. The punched card, the cash register, the nineteenth-century Difference Engine, the wires of telegraphy all played their parts in weaving the spider web of information to which we cling. Each new information technology, in its own time, set off blooms in storage and transmission. From the printing press came new species of information organisers: dictionaries, cyclopaedias, almanacs-compendiums of words, classifiers of facts, trees of knowledge.*
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> *Hardly any information technology goes obsolete. Each new one throws its predecessors into relief. Thus Thomas Hobbes, in the seventeenth century, resisted his new era's new-media hype: "The invention of printing, though ingenious, compared with the invention of letters is no great matter". To a point, he was right. Every new medium transforms the nature of human thought. In the long run, history is the story of information becoming aware of itself* (Gleick, 2011, pp.11-12).

The digital revolution, like the print revolution, creates new media that is transforming human thought. Again it is tempting to say that the invention of the personal computer moved society from the analog to digital transmission of data. In this case, an alphabet of bits and bytes converts traditional alphabetic symbols to a binary language of 1's and 2's that represent a 'on' and an 'off' mode. This deceptively simple notion re-invents analog music, video, and audio data and generates new genres of human expression and communication such as social networking, digital storytelling, and video gaming. Reading and writing are becoming social, rather than solitary, events, presenting new challenges for promoting the emerging literacy of adolescents.

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Behind digital texts, sounds, and images are a new vocabulary and syntax that support hyper-text, interactivity, and emerging technologies. New conventions will re-define old ones as human thought is transformed.

The new Information Age is not an artefact of digital technology; it is the evolution of literacy to a new medium. Information has been at the forefront of every age since the invention, or re-invention of symbolic ways to represent human thought and creativity.

The result of the most recent information revolution is a new kind of literacy that is non-linear and multi-modal. A transliteracy approach (Liu, 2007; Thomas, 2005) identifies the complex dimensions of digital literacy. The Transliteracies Project (Liu, 2007) researches technological, social, and cultural practices related to online reading. Transliteracy differs from the familiar concept of multimedia because it explicitly studies online reading which Liu defines as:

> *. . . the experience of 'text-plus' media by individuals and groups in digital, networked information environments. The 'plus' indicates the zone of negotiation – of mutation, adaptation, cooperation, hybridization, etc. – by which the older dialogue among print, writing, orality, and audiovisual media commonly called 'text' enters into new relations with digital media and with networked communication technologies* (Liu, 2007).

Thomas (2007) defines transliteracy as, ". . . the ability to read, write and interact across a range of platforms, tools and media from signing and orality through handwriting, print, TV, radio and film, to digital social networks". While transliteracy is a working concept rather than a theory of information, it has its place in the discussion of what it means to be literate.

How does the digital environment affect information and reading behaviours?

How we conceptualise information and literacy raises questions about how we help youth to become digitally literate. As reading and writing in digital environments become social, rather than solitary events, elements of the oral tradition are returning to integrate with the conventions of traditional, print-bound literacy. It is important that school librarians and other educators ask the questions that matter. What does transliteracy instruction look like? What does it mean to process and manage information in a transliterate digital environment? What does 'reading' mean in virtual spaces? How does the digital environment affect information and reading behaviours? These questions are informed by what we already know about information and reading behaviour.

What we know about the effect of digital environments on information and reading behaviour

People have always adjusted the way they read according to the genres, their purposes for reading, and the new technologies that are evolving (Manguel, 1996). Research indicates that the way people read digital text is different from the way they read print. Readers have developed new strategies for handling large volumes of digital information. Attention spans seem shorter and reading is becoming increasingly shallow. In a study at the University of Virginia, students characterised their reading in terms of reading just in time, skimming, or scanning material. One student reported: "Okay, I have another 10 minutes before class . . . what can I do? So I started out just looking at, just reading the chapter headings for the chapter" (Marshall & Ruotolo, 2002, p. 20).

The role of paper is changing. It is becoming less common to print electronic documents just to read them. Readers are printing out documents for other reasons because paper offers clear advantages over digital technologies for certain cognitive tasks (Sellen and Harper, 2001). People like to have the printed document as a reminder to read it or to share it. A study of university professors showed that they printed out documents which required close attention such as documents used for reference and grading (Marshall and Ruotolo, 2002). Paper provides vital support in its role as a visible reading technology. With paper text people can physically interact with the text by making personal annotations or notes or highlighting in the text, by physically gathering materials for a focused task, and by clipping, or physically cutting out text such as an

article from a newspaper. Sharing reading material is an interactive process more likely to happen with print text.

People are reading from their screens on their Pocket PCs, iPhones, and Blackberrys. A study of office workers found that reading is not a well-defined activity when done on the screen. When office workers read on paper, they have a clear sense of what reading is: it is a focused engagement with a single document, distinguished from related activities such as writing, filing, or talking on the telephone. On the other hand, when office workers use electronic documents, activities blur: they multi-task and skim the text (Marshall and Luckhurst, 2001). Mobile devices provide a better form for reading than computer screens. Increasing numbers of readers are carrying screens around with them that are more suitable devices for reading.

Research that identified the coping strategies described above paved the way for research on adolescent information behaviour. Rowlands and Nicholas (2008) found that youth has a preference for natural rather than controlled language and a strong tendency to use keyword spotting to avoid information overload. They use simple search strategies and have an unsophisticated mental map of the Internet. They do not review information retrieved from online databases for relevance, nor do what they think are unnecessary searches when they have already obtained the information required. Essentially, there is very little evidence that the Google generation is fundamentally different: there is little improvement in information literacy capabilities, including evaluating information and the authority of sources. These information behaviours are especially toxic for adolescents who struggle to develop improved reading comprehension. Liu (2005) found that adolescents spend more time one-time reading, non-linear reading, and read more selectively. They spend less time on in-depth, concentrated, sustained reading (Liu, 2005).

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What are the implications for the role of the school librarian in promoting and supporting literacy?

How do the information and reading behaviours of youth affect the way that school librarians support literacy? A study conducted in Delaware (Todd & Kuhlthau, 2005) revealed that school librarians have traditionally played a motivational role in reading through the selection and promotion of library materials. The school librarian's efforts to encourage reading revolve around connecting children with books, particularly those books in the school library collection. Most reading initiatives that are school library-based or supported by the school library tend to emphasise the reading of fiction which has had important consequences for boys, whose reading preferences are for non-fiction, in particular the areas of sports, pop music, and history, including war. (Lu & Gordon, 2007)

School librarians' efforts to promote reading focus on motivating students to read through book talks, author visits, library displays, reading lists, and book fairs. (Todd & Kuhlthau, 2005). While these activities may raise the profile of reading, they do not directly involve students with interacting with text. Less often, librarians become involved in Free Voluntary Reading (FVR), which the research tells us has dramatic effects on improving reading, vocabulary, spelling, writing, and increasing motivation to read (Krashen, 2004). Programs in sustained silent reading create a culture of literacy as a fixed time is set aside for principals, custodians, teachers and students to stop work and read something of their choice. Although sustained silent reading has been shown to have good results in raising reading scores, many schools are reticent to take time out of the school day for free reading. Despite the research evidence that FVR is as, or more, effective than direct instruction aimed at remediating reading (Krashen, 2004), educators and policy makers do not seem convinced that proximity to books and other reading materials, time to read, and a comfortable, inviting place to read, is effective in raising reading scores.

Another form of Free Voluntary Reading practised in schools is mandated summer reading, which is an American phenomenon not widely practised worldwide. School librarians collaborate with teachers to create grade level summer reading lists from which students are required to read at least three titles during their summer break. They also complete a project for each of the three books they read. These programs are

typically based on limited choice, although the reading research finds that free choice is critical for motivation to read. Summer reading lists are typically overloaded with titles of classics, rather than books written for young adults. This has had consequences for low achieving students (Lu and Gordon, 2007) who prefer books about characters and issues relevant to their lives.Reluctant and low-achieving students also express a strong preference for alternative print media (i.e., magazines and newspapers (Gordon and Lu, 2008) and the web.

Access to microcomputers and the World Wide Web in schools, homes, and libraries is dramatically changing how educators support and encourage reading. Informational text is no longer confined to a fixed library collection. Rather, the library collection is extended by a wide range of reading materials on various reading levels and subjects and in a variety of media formats. Students are no longer confined to a fixed library collection carefully selected by a school librarian. Unmediated reading materials and free access ensure that even the best of readers will encounter reading materials that are at their level of frustration. In addition, the role of information in learning, especially through inquiry learning, is shifting the school librarian's priority to reading information text with comprehension. Research which studied how good readers monitor their comprehension resulted in reading for understanding strategies that are effective in raising the learner's consciousness about comprehension. These strategies offer strategies students can use to fix comprehension when it breaks down (Goudvis and Harvey,2007**)**. These strategies are particularly well-suited to inquiry learning and the interventions that support student progress through the Information Search Process. An important question for school librarians is whether these strategies work in digital environments and how they might be adapted for digital information searching and reading.

School librarians structure research units that engage students in problem oriented learning tasks rooted in real world issues. This pedagogy has transferred well to digital spaces. Since information skills are seen as thinking skills, students manipulate and transform information using the tools of higher order thinking: understanding, remembering, applying, analysing, evaluating, and creating (Anderson, L.W., et al, 2001). Web 2.0 tools are effective in supporting inquiry learning. They function as interventions that provide help for students' information seeking and reading in digital spaces while supporting inquiry learning.

. . . information is the raw material for building knowledge.

It is clear that school librarians are at the crossroads of the transition from print to digitised information. They know that information is the raw material for building knowledge. They understand that literacy has several meanings as new and complex media formats and genres are evolving. They are the only professionals in education who understand the power of information and its intimate connection with learning. These understandings are critical to the teaching decisions that school librarians and educators are facing today. School librarians are positioned as leaders in helping educators understand and appreciate that information studies are highly relevant to helping students to develop transliteracy skills. It is time that this body of existing and emerging research is recognised as critical to understanding and designing learning processes for young people that are relevant to the digital age.

School librarians can help frame the right questions in order to arrive at pedagogical solutions that work. These questions are not about hardware; they are about how technology is wiring our brains and changing the way we see the world. These questions are not about whether library collections should include print or e-books, but about what it means to process information and read in a digital age. These questions are not about the future of the book, or any other reading technology, but about the future of information searching and reading.

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