The best of both worlds: Reading in print and digital environments

By Carol Gordon

The medium is the message.
Marshall McLuhan

The medium in which written language is embedded has a profound effect on reading, and in that sense, the medium is the message. Even after the printing press placed written text in the hands of an elite, literate class, oral reading was the socially acceptable convention. In fact, reading aloud persisted in Europe for decades until literacy was as widespread as the printed page. Reading silently as we know it has been an accepted reading practice for only a few hundred years.

As reading and writing have moved through the media of stone, clay, papyrus, paper, and the screen of an electronic device, the meaning of literacy, as well as the medium for reading and writing, has changed. Those changes are not always immediate.

Greek culture depended on the encoding of information in poetic texts that were learned by rote and recited to perpetrate social ethics and moral codes. It was not until the fourth century, during the age of Plato, that the dominance of poetry in an oral culture was challenged by literacy (Birkets, 1994).

The electronic age has placed reading in the ". . . midst of an epoch-making transition; . . . the societal shift from print-based to electronic communications is as consequential for culture as was the shift instigated by Gutenberg's invention of movable type" (Birkerts, 1994, p.192). As reading migrates from print to digital text how will reading change? Will books, or any sustained written discourse, become obsolete? Will we enter a post-literate society, or is there a new literacy emerging from digitized text? The answers to these questions depend on a reading paradigm shift that will not take centuries. In fact, it has begun.

The difference between reading in print and digital environments

The inherent differences between text encountered on paper and on screen could explain the difference between information and reading behavior in these media. Birkerts (1994) describes print as linear and ordered. Translating printed symbols requires the reader's attention. Engagement in print is a private communication between the writer and reader. The turning of pages and vertical pattern of reading down the page gives the reader a sense of moving forward in a sequential way. The reader controls the pace based on his or her focus and comprehension. On the other hand, electronic content travels along a public network and engagement is part of a greater connectedness that can be passive or active. Electronic content does not have the permanence of print: it can be changed or deleted with the stroke of a key. The pace is rapid and the movement is horizontal, rather than vertical. (Birkerts, 1994). The medium seems to carry a subliminal message that transforms the way the reader responds to it.

A recent study of 895 Internet stakeholders (Pew Internet & American Life Project, 2010) revealed that more than half of respondents believe reading will be different in ten years. There will be a new fluidity in media creations, with visual representations and storytelling emerging as important to 'screen' literacy. A study by Rowlands and Nicholas (2008) profiles the 21st century information user. Search engines, not library catalogues, are their primary starting point: 89 per cent begin their search with a search engine, while only two per cent start from the library. The researchers conclude that information literacy skills of the 'Google Generation' are not better than any other generation, despite the time they spend online. The average times that users spend on ebook and ejournal sites are four and eight minutes respectively. The study reports that information searching is characterised by skimming, scanning and squirreling, or hopping from one resource to another, and rarely returning to print-outs. It is clear that users are not reading online in the traditional sense. Instead there are signs of new 'forms' of reading as users 'power browse' across titles, content pages and abstracts. It almost seems that they go online to avoid reading in the traditional sense (Rowlands & Nicholas, 2008).

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Changes in the technologies and the character of modern life may be putting an end to reading in depth. That's the fear, at any rate, in some quarters . . . It isn't that the book has gone away, but rather that the cultural conditions for (deep) reading . . . are fast disappearing (Levy, 2001, p. 109).

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 said, "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).

In addition, the role of paper is changing. People seem to be choosing between paper books and electronic text according to their purpose in reading them, and are not necessarily printing. Mobile devices encourage this trend as increasing numbers of readers carry iPhones, iPads, and Blackberrys that are purpose-built for reading. However, paper offers clear advantages over digital technologies for certain cognitive tasks (Sellen & Harper, 2001). People like to have the printed document as a reminder to read it and share the information with others. In another study, university professors preferred to print out documents to read them when those documents were used for reference and grading (Marshall & Ruotolo, 2002).

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The consensus is that reading in electronic environments is passive and shallow, and reading is more likely to be interactive in print environments. This new reading paradigm is described as a "mere decoding of information" (Wolf, 2007). Our ability to interpret text, to make rich mental connections that are formed when we read deeply and without distraction is disappearing (Wolf, 2007). Since reading is not an instinctive skill (Wolf, 2007), readers' minds are trained to translate symbolic characters on the computer screen into a language they understand. The medium of digital technology is changing the way we read and write because our brains have the ability to re-program these processes. What we read can alter the way the brain functions and adapts to the technology we use (Wolf, 2007). This theory has implications for the way technology is shaping information behaviour, reading, and thought processes.

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The question of what it means to read becomes even more complex when students move from reading informational text to understanding, and appreciation of literature. Birkerts (2006) notes the nature of this dimension of reading as "The knowing not of facts, but of truths about human nature and the processes of life" (p. 74). Wisdom, or the understanding of human phenomena, does not emerge from bits of information users collect from electronic impulses, but from the deep time it takes to understand text in a stable context where it resonates within us (Carr, 2008).

Implications for the role of teacher-librarians in reading

The implications of the print-digital reading dichotomy are significant for teacher-librarians. As the digital environment is strengthening its foothold in the culture of reading, print and digital environments are in transition and readers need to be 'bi-textual' translators of the two mediums. Text in print and ebooks and ejournals that increasingly simulate print transmit the advantages of reading in print. Printing, faxing, and scanning provide convenient transformation of text in electronic formats to print. Students still need to experience physical interaction with print by making personal annotations and highlighting in the text. Engagement with print is enhanced by physically gathering materials for a focused task, clipping text, and manipulating it using labels and categories. Sharing is another interactive process more easily accomplished with print text. People may still read alone, but their capacity for interpreting this material is circumscribed by the communities to which they belong. In many learning communities, such as literature circles, there are circumstances in which people read together. These activities are opportunistic, occurring when a reader encounters something of interest. Readers express a connection to the text through these kinds of interactions. During spontaneous shared reading, teacher-librarians can capture the social nature of reading, learning, and interpreting text.

In addition to holding on to print-related strategies, the teacher-librarian's role in reading is taking on new dimension. In the 20th century, teacher-librarians worked with a fixed collection they selected and mediated. They focused on

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motivating students to read for recreation, with a strong emphasis on fiction. Reading motivation activities included reading lists, book talks, book displays, author visits, book fairs, and other passive activities that did not directly engage adolescents in reading (Todd, 2004). Free, voluntary reading (Krashen, 2004) and programs like Sustained Silent Reading were not consistently used, despite strong research evidence that they were as successful, or more successful, than direct remedial reading instruction.

In the 21st century the teacher-librarian's role in reading is transformed to emphasise reading non-fiction texts. Research reveals gender differences in the reading preferences of adolescents: boys voice a strong preference for non-fiction (Smith, 2004).Since library collections are no longer mediated and controlled by the teacher-librarian, students have the freedom to access and read almost anything. Consequently, even the best readers will encounter readings that are beyond their ability to read and comprehend. Teacher-librarians also face a shift from information- to knowledge-centred standards for school libraries, with emphasis on learning content through the use of information, rather than using skills exclusively for searching and finding information. Inquiry learning, which requires focus, concentration, and deep reading, runs counter to online information and reading behaviours described in this paper. Reading strategies embedded in inquiry learning are the antidote for shallow online reading. Teacher-librarians can seamlessly address reading informational text with understanding and depth in the context of inquiry learning. What are these reading for understanding strategies? How can teacher-librarians incorporate them into their inquiry-based instruction?

Reading for understanding in school libraries

The first step in promoting reading for understanding is to help students become conscious of their comprehension when they are reading. When comprehension breaks down, many students skip sections or words that are confusing and pick the text up again where they can understand it. This behaviour results in loss of valuable information and the opportunity to improve reading (Goudvis & Harvey, 2007). Is there a way to build reading comprehension within the framework of inquiry so that an activity that promotes comprehension can also serve to move the inquiry forward? The answer is yes. That framework is Kuhlthau's (1986) Information Search Process (ISP) shown in Fig. 1.

Figure 1: The Information Search Process

	Initiation	Selection	Exploration	Formulation	Collection	Presentation
Feelings	Uncertainty	Optimism	Confusion Frustration Doubt	Clarity	Sense of direction; confidence	Satisfaction or disappointment
Thoughts	Vague			Focused		Increased self-interest Increased Interest
Actions	Seeking relevant information Exploring				Seeking pertinent information Documenting	

The ISP is a diagnostic tool that helps the teacher-librarian interpret the thoughts, emotions, and actions of the student in the context of predictable, research-based stages of information seeking. This is accomplished in the context of Guided Inquiry, which is:

> . . . carefully planned, closely supervised targeted intervention of an instructional team of school librarians and teachers to guide students through curriculum based inquiry units that build deep knowledge and deep

understanding of a curriculum topic, and gradually lead towards independent learning (Kuhlthau, Maniotes & Caspari, 2007).

ISP stages are closely aligned with reading for understanding strategies, which serve as interventions. For example, the task initiation stage (Fig. 1) is characterised by uncertainty when students are looking for relevant information that will help them move on to topic selection. Activating prior knowledge and experience creates a foundation for building new knowledge. It is also a reading strategy that promotes reading comprehension as readers apply what they already know to what they are reading.

Table 1 provides examples of reading strategies that coincide with ISP stages and supplies traditional, as well as Web 2.0 tools that simultaneously heighten awareness of reading and facilitate inquiry. For example, Wordsift (Table 2) incorporates a 'wordle', or graphical representation of a body of text created by displaying, in varying sizes, the words most frequently occurring in the text. The Wordle is accompanied by images that relate to the prominent vocabulary of the text, serving to activate prior knowledge and build background knowledge. In the parlance of Guided Inquiry, the Wordsift is an intervention that facilitates the Information Search Process.

Table 1: ISP Stages and Reading for Understanding Strategies

ISP Stage	Reading Strategy	Print Interventions	Web 2.0 Interventions
Initiation (Task)	Activate prior knowledge Visualize	K-W-L Chart Visuals & Reflection Sheet	Wordsift Digital K-W-L
Exploration	Ask questions "I wonder…?" "What if…?"	Brainstorming	Blogging Twitter
Selection (Topic)	Distinguish between main/supporting ideas	Subject search in a subscription database	Wordle WonderWheel*
Focus	Decide what's important Make connections Text-to-self Text-to-world Text-to-text	Relate focus to personal interests, family issues Making connections Customized K-W-L chart that helps students make connections between what they know and new text.	Social networking tools Websites relevant to the developing focus
Collection	Summarize Synthesize Make predictions	Graphic organizers Concept mapping Double-entry journal	Inspiration Kidspiration
Presentation	Make inferences Draw conclusions	Peer Review: Praise, Question, Polish	Wiki

*WonderWheel is embedded in the Google search engine. Follow the following steps:
Google a topic (e.g., Greenhouse effect)
Go to the top of the hit list and click on *Show Options*
Scroll down to the bottom of the list on the left side of the screen
Click on WonderWheel

The reading strategies listed in Column 2 of Table 1 are not restricted to the ISP stage to which they correspond. Similarly, the interventions listed in Columns 3 and 4 may apply to other ISP stages. The links provided for the interventions in Column 3 go to examples and explanations of the interventions. The links in Column 4 connect directly to the Web 2.0 interventions.

It seems ironic that Web 2.0 social networking tools offer solutions for information and reading issues presented by digitised text. A holistic view of learning through inquiry, however, creates a confluence of information seeking, reading, and thinking. Such a viewpoint removes artificial borders around these three components of learning. Information skills are thinking skills. Information use, built on the basic information skills of searching, retrieving, and evaluating information, cross the border into critical thinking skills where learners apply, analyse, evaluate, and synthesize, or create.

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Likewise, reading skills are thinking skills. Only when learners go beyond the basic reading skill of decoding to understanding what they read can they engage in critical thinking. School libraries are at the intersection of information, reading, and thinking, where these functions of learning work synergistically, rather than in parallel. In the context of Guided Inquiry, teacher-librarians present an economy of instructional intervention that yields huge benefits, including enabling learners to negotiate print and digital environments successfully. In a universe of information and reading, learners can have the best of two worlds: the focused concentration and depth of print, and the sweeping gestalt and engagement of digital text.

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