Leadership and the New Literacies

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Abstract

In a knowledge era, it is essential that educators explore educational and policy questions about the character, power and reach of digital literacies. Moving beyond a simplistic notion that the computer is merely a new kind of tool that can be easily integrated into conventional learning environments, this presentation suggests that wise policies and skillful leadership are required to move us beyond current efforts to implement "computer literacy" and into a place where schools actively cultivate new ways of learning, thinking and communicating made possible by the digital tools that shape our daily lives.

Introduction

There is a great deal of current interest in literacy at both the classroom and the policy levels. From a Canadian perspective, this interest tends to cluster in three major areas: how can we ensure that increasing numbers of Canadians emerge from the school system able to, and interested in, reading and interpreting text in complex and sophisticated ways? In particular, how do we ensure that the large number of ESL students who enter our school system acquire advanced literacy skills, and how do we ensure that regardless of socioeconomic status, all Canadians have equality of opportunity to learn? These are important questions, worthy of close attention by educators, by researchers and by policy makers. If the recent PISA study of 15 year olds in OECD countries is a good measure, then Canada has been doing a very good job. Today's 15 year olds read at a level that

place them in the top 5 OECD countries. Moreover, the gap between highest and lowest scores is narrowest in Canada, indicating success in creating strong literacy skills across socioeconomic levels. The picture of how engaged and committed students are to reading a wide variety of texts draw our attention, however. Canadian students appear be skillful readers, but nearly 50% choose to read mainly magazines, newspapers and comic books. Interpretations of the data suggest that low and moderate diversity in reading materials of choice indicate that reading widely for pleasure may not be a fact of life for half the young people in our country.

Thus, there are reasons for both optimism and for policy and curriculum attention concerning text based literacy, and we are certain that people are looking carefully at the details of this report to guide next steps in literacy development in Canada. For the purposes of this presentation, we want to pose two questions:

1. *Are there ways we can create more engagement with a wider variety of text so that students are reading for information and pleasure on a more frequent basis? Is there a role for technology in increasing our literacy repertoire in schools?* It is instructive that while the PISA study included a question about students' reading in online environments, no data were reported. While we know that many young people spend a lot of time online, we have very little understanding of what kinds of literacy skills they use, and need to develop in order to learn effectively in digital environments.
2. *How do we understand reading and composing in hyperlinked and multimedia environments?* The web is one of the media of students' times. Online

> environments have their own character, and demand a suite of skills that straight text-based reading and composition do not address. While others attend to improving student skill and engagement with text, we would like to branch into an examination of issues that these new literacies might involve. In this, we are guided strongly by the work of Andrea di Sessa, who asks, can education be transformed by technology so that children can learn more, learn more easily at an earlier age, and learn with pleasure and commitment? Can we create "two way literacies" where everyone becomes a creator as well as a consumer of dynamic and interactive expressive forms? (di Sessa)

Technology and Literacy

> *Technology does not necessarily improve education. Take a simple innovation like the pencil: One can use it to write a superlative essay, to drum away the time, or to poke out someone's eye (Veenema & Gardner).*

As di Sessa points out, all literacies, including conventional text-based ones, have 3 fundamental pillars: the material, the cognitive and the social. Understanding these pillars will take us some way in opening up questions that let us think about the educative uses of technology.

1. The material pillar: signs, symbols, depictions or representations.

"…We can install some aspects of our thinking in stable, reproducible, manipulable, and transportably physical form. These forms become in a very real sense part of our thinking, remembering and communicating" (di Sessa, 2000, 6). Written language is the current prototype of literacy. At the moment, studies of literacy focus on written text, and students' abilities to think in important ways with the material tools of letters, words, sentences and paragraphs. Being literate means being able and eager to read a wide range of written materials from comic books, magazines, newspapers, short and long fiction, poetry, and non-fiction.

The current question we should now be posing is, what is the material basis of digital literacy, and how is it changing what we will come to call basic literacies in a digital age? As di Sessa notes, "We have much to gain by thinking carefully about what the whole game of literacy is and about what we can do with computers than can either hasten or undermine new possibilities. (8)

2. **The cognitive pillar: how we think**

We know that "new computer literacies will build on and extend humans' impressive spatial and dynamic interactive capabilities far more than conventional literacy does" (di Sessa, 2000, 8). As Howard Gardner has demonstrated in his work on multiple intelligences, intelligence is complex and richly textured. Written language plays only a limited role in the development of *spatial intelligence*. We know that the structure of websites requires precisely this intelligence both to compose and to consume with

discrimination. The increasing interactivity of the web calls strongly on the *interpersonal intelligence*, conventionally the domain only of group work in classrooms. And the power of asynchronous environments such as email and discussion forums enhances both shared and personal reflection (Herod), a key element of *intrapersonal intelligence*. As di Sessa notes, "the simultaneous tracking of our understanding of intelligence and knowledge along with materially enhanced versions of them is, for me, among the most scientifically interesting issues of our times" (2000, 8). It is certainly an emerging and fascinating issue in understanding the nature of literacy in a digital age, and it raises seminal questions about how to teach for, and through, these emerging literacies.

3. The social pillar: knowledge building

In pre-digital eras, learning was largely regarded as an interior, individual, unobservable process of acquiring skills, knowledge and beliefs. In a digital age, we begin to take seriously what Scardamalia and Bereiter call knowledge building: "the creation or modification of public knowledge—knowledge that lives 'in the world' and is available to be worked on and used by other people" (Scardamalia & Bereiter, in press). In this space, all ideas are regarded as constantly improvable through others' ability to pose theories, build on contributions, ask questions, posit new theories, offer evidence from contrary perspectives. In order to learn to their full potential, individuals must develop and contribute ideas that are both shared and extended by others.

It is becoming commonplace to observe that information and communications technologies have as much potential as the invention of the printing press to transform

our society. As with any of the major intellectual accomplishments of any society, “there is always a gradual, cumulative development that involves many people" (di Sessa, 2000, 19). The introduction of new technologies such as books, radio and television were not instantly transformative in their impact. It was only as people learned what these technologies for good for, and how they were both similar to and different from the ones that preceded them that their use became widespread and fully understood in use. It is helpful to recall that when automobiles were first designed and built, there were serious debates about where to place the buggy whips on the chassis, so ingrained were the conventional notion of horse-drawn transportation. We are currently in the horseless carriage state of thinking about digital literacy. Tied strongly to the assumptions of the individual as the primary site of learning, we are either asking the wrong questions about computer literacy (ie how do we make students more fluent with applications?) or we have difficulty seeing the really important differences in composing and reading digital text. We see such strong ties to the dominant understanding of text-based literacy in teachers’ interest in creating courses to be delivered on line, electronic versions of worksheets, and digital repositories of textbooks. The Web attracts our attention as a fundamentally new environment, but we must understand that it is still in its infancy , particularly in terms of the current capacity for interactivity and social connection. Thus, a naïve enthusiasm that the mere appearance of interactive technologies will transform learning without any effort on educators’ part to understand what they can, and cannot, do is also misplaced.

From a policy perspective, we must pay attention to the literacy implications of the widespread use of online environments. As one example only, a 1999 survey by the US media watch group The Pew Research Center, found that "more college graduates under the age of 50 connect to the Internet every day than regularly watch one of the network news broadcasts" (Teoh Kheng Yau & Al-Hawamdeh). In any transformation, "a community decides a material intelligence is powerful and valuable enough that it is worth the considerable effort of teaching it to all newcomers (di Sessa, 2000, 19). Consider that for almost the first third of the 20th century universities such as Oxford and Cambridge did not offer degrees in English literature. It was simply understood that reading novels was simply something that a gentleman did in leisure time. It took a while for educators to decide to teach literature, to introduce film and media studies into schools, to teach film making as part of mainstream language arts, to investigate popular culture in systematic and scholarly ways. Each time, these literacies were dismissed as entertainment not worthy of the serious attention of educators. We think that new media environments such as games, simulations, and innovative uses of online spaces currently fall into this category. They are literacies education does not yet understand well, and their power remains largely harnessed to conventional ways of doing things, such as talking books, phonics programs, the internet as a source of information for reports and essays, or downloading digital objects.

Cognitive view of material intelligence

Literacies of all sorts allow us to think about the world in particular ways. "Every good new system changes the set of ways we can think about the world. If we happen to have in hand a system that is apt for learning or inquiring into a new area, we make progress quickly" (di Sessa, 2000, 16). New literacies have the power to "rearrange the entire intellectual terrain. New principles become fundamental and old ones become obvious. Entirely new terrain becomes accessible, and some old terrain becomes boring (19).

So what is being rearranged in the intellectual terrain?

In an intriguing study called "The impact of the internet on teaching and practicing journalism", the authors note that, to the surprise of many, a study of about 70 internet users in Florida and Chicago found that text seems favored over artwork for front page attention. Tracking readers' eye movements, researchers found that "briefs and captions got the initial eye fixations when the first page came up. Then the eyes came back to photos or graphics…" (p.2) Moreover, readers skipped back and forth between sites rather than spending sustained time in any one place. If the experience of readers of online newspapers can be generalized to reading websites of all kinds, several issues emerge:

1. While words remain an integral part of the experience of online environments, new ways with words are needed to hold readers' attention. Hypertext, graphics and sound have created story structures that are fundamentally 3 dimensional. Links between sections on a page are not linear. Graphics do more than simply embellish the mean

of written text, and sound becomes a potential aspect of meaning. The reader's ability to move through a site in many ways is a crucial fact of navigation that requires design skills that are simply not needed in conventional text. Online, information is gathered and meaning is created in ways that differ significantly from the left to right, top to bottom structure of conventional text. All of a sudden, the old organizers of "beginning, middle and end" simply are not enough to understand how to compose and read online.

2. "When radio started, people first read newspapers on the air and that didn't work, and radio developed its own writing style. We read radio writing on TV, and TV eventually developed its own storytelling technique. Right now on the Web all we're doing is using old storytelling techniques, instead of developing new ones" (Harper cited in Teoh Kheng Ya & Al-Hawamdeh). This is one of the symptoms of the Web's infancy. At the moment, readers have some ability to navigate, to choose where they will surf and how long they will stay in any one part of a site. What is emerging is the opportunity to do more than interact with "canned content" predetermined by others. In this arena, new media practitioners and the arts and science communities in particular are leading the way in creating radically different digital environments in which the "push" of information structured in newspapers, books, television reports and film is being replaced by interactants' ability to "pull" what they want, when they want it, how they want it. Immersive technologies show promise in placing control in the hands of viewers who can put themselves in alternative parts of an event, request others to supply added information, or re-create

real world events to surround "the viewer with a visual, aural, and even tactile experience." (Al-hawamdeh).

3. Time emerges as a feature of literacy we have not had to attend to with as much urgency in the past. Even in the rush to get books about popular phenomena such as the death of Princess Diana or the American invasion of Iraq to press, there is a lapse of months between writing and publication. When people want to know about late-breaking events, they turn to online sources for up-go-the-minute, constantly changing sites. This push for timeliness and multiple perspective puts enormous strain on our conventional structures for assessing the accuracy and credibility of information. At the moment, teachers tend to see these issues as a problematic limitations of web based information sources. "There's so much trash on the web, "they complain, "and students just grab the first sites that come up." What we need to understand better is that assessing the trustworthiness of sites is, in fact, part of the material structure of literacy in a knowledge era. How many points of view do you need to garner to assess the accuracy of a story you find online? How do you know whether the organizations which sponsor sites are credible and trustworthy? How do sites provide for corrections and updates that draw attention to changing information and understandings as stories unfold? These are important skills and dispositions in a digital age.
4. Moreover, the increasingly mobile, connected world in which young people live permits the instantaneous transfer of voice, text and images any where, any time. Schools do not yet understand the literacies required in this milieu, and because we

do not know what to attend to, we are not yet helping students how to interpret, create and critique environments in which they are currently only avid consumers.

5. Contrary to current emphasis on teaching students how to master and use computer applications, new media practitioners tell us this: tools do not matter, because tools change fast. What matters is mastery of the medium, particularly new ways of storytelling and communicating information so that it becomes knowledge to which people will attend, through which they can interact, and which they can use for their own purposes. This mastery is an essential component of the exploration of simulations. As Shirley Turkel suggests, "we need to understand that the computer is a simulation machine, the new stage for playing out our fantasies, both emotional and intellectual…From this point of view, what children need to know is how to play on this new stage, how to sort out the complex relationship between the simulated and the "real," between representations of the world and the world itself…An eleven-year-old child who spends an afternoon manipulating images on Adobe *Photoshop*, creating landscapes that exist only within the computer, may use the software as an object-to-think-with for thinking through issues at the center of contemporary cultural debate. And yet it is often the case—too often the case—that experiences with simulation do not open up questions but close them down". However, as children learn to design, build and critique simulations, they can be taught to understand and to challenge any model's built-in assumptions rather than just clicking through, edutainment-wise. This is a fundamental new literacy that we have seldom, if ever, seen developed in schools, even though children spend hundreds of hours in gaming and simulation environments outside school.

6. The concept of intellectual property and digital objects that can be accessed, but not modified, in online environments, must change. Sometimes called the "remix culture", people who compose and interact in web based environments expect to be able to modify and rearrange digitized video and sound clips, "hyperlinking the multimedia enhancements into a compendium of stories in different formats"(Al-hawamdeh). Repurposing, recycling, reusing existing content blurs distinctions among media and collapses the restrictions of air time that limit radio and television content, and book or article length that limits print. Composing and reading in multimedia, hyperlinked environments means being able to tell a story whose key elements emerge at a glance, but that also permit increasing depths and blends of explorations as readers require them. At the moment, draconian federal legislation to protect digital copyright is in process, and it is moving in exactly the wrong direction for a knowledge era. In a content-push environment, school assignments are so predictable that livings can be made selling papers on line to lazy or desperate students. In a remix culture, digital objects are meant to be changed, rearranged, rethought, juxtaposed, discussed and shaped…not just consumed.
7. Digital literacies demand the ability to tightly integrate sound, words, numbers, images, shapes and colors into new communication units. The new science of information mapping treats chunks of text as the essential unit of meaning, rather than individual words or sentences. Context thus comes to the fore as essential to the creation of meaning. Contrast this with the conventional "chunks" of text-based meaning: phonemes, syllables, words and sentences unconnected in meaningful ways

from other communications elements. We see that artful use of briefs and captions become significant in attracting and directing attention.

8. Finally, the ancient arts of storytelling are enjoying a surprising revival in our high-tech world. Schools as we know them today were designed for a time when information was in short supply, primarily in textbooks and in the head of the teacher, with limited access even to books in libraries. Today, some say we have the problem of an information glut, which probably isn't true. In what sense could one ever have too much information, after all? But clearly, turning information into knowledge through the creation of unexpected insights is the storyteller's art. And if we are stuffed with information and starved of meaning, then perhaps understandings that narrative is a fundamental cognitive structure will direct our attention to how to we teach students how to create and communicate the story in anything they seek to understand will take on new urgency.

Conclusion

We have touched only briefly on issues that educators and policy makers might attend to in order to understand the implications of digital technologies and the literacies they both support and require. As di Sessa suggests (2000, 22), "we simply cannot afford to limit our explorations of possible future literacies to extrapolations of what we think we understand about literacy now". The need for strong text based literacy will not disappear in a digital age. Students who cannot read in conventional ways will not suddenly be able to read simply because they now go online. We are tempted to say

that that goes without saying, knowing that precisely the things that go without saying are most readily misunderstood.

What we want to ask her are additional questions that direct attention to areas that are too often marginalized as of interest only to technology specialists. We return to the initial questions with which we began the presentation:

1. Are there ways educators and policy makers can create more engagement with a wider variety of texts so that students are reading for information and pleasure on a more frequent basis. Is there a role for technology in expanding our literacy repertoire in schools?
2. How do we understand reading and composing in huperlinked and multimedia environments?
3. Can education be transformed by technology so that children can learn more, learn more easily at an earlier age, and learn with pleasure and commitment? Can we create “two-way literacies” where everyone becomes a creator as well as a consumer of dynamic and interactive expressive forms?

These are genuinely open-ended questions whose answers are in part pedagogical, but in larger part a matter of the policy vision and political will to explore the educational possibilities for computational literacies. Ending with some provocative challenges by di Sessa, we suggest that

1. "textual literacy draws on certain human competencies and not others. For example, the immense competence of humans in dealing with both dynamic and

spatial configurations is barely engaged by conventional literacies. We can do better electronically." (di Sessa, 2000, 27)

2. "We can wait for things to happen by accident, or with due respect for what we do not know, we can move deliberately in the direction of the best we can imagine." (di Sessa, 2000, 27)
3. "Hardware is much less the issue than software. It is difficult to make money with educational software. The research and development of future literacies is an issue of public trust if ever there was one, but the issue doesn't even appear on the agenda of any government agency. If …[our]conclusions …are correct--or even a responsible good guess--we are making a terrible mistake by this omission. " (di Sessa, 2000, 28)
4. "Cultural and technical history are powerful currents…In the best case, blindly following current directions means a delay, possibly a long one. " (di Sessa, 2000, 28)

Let us finish with additional words from Shirley Turkel:

> Walt Whitman once wrote: "There was a child went forth every day. And the first object he look'd upon, that object he became." We make our technologies, our objects, but then the objects of our lives shape us in turn. Our new objects have scintillating, pulsating surfaces; they invite playful exploration; they are dynamic, seductive, and elusive. They encourage us to move away from reductive analysis as a model of understanding. It is not clear what we are becoming when we look upon them—or that we yet know how to see through them.

Figuring this out—what we are becoming when we look upon the world of digital technologies, and how to see through them—is precisely the work that lies before all of us.

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