New Literacies of Online Reading Comprehension

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Literacy as Deixis

Literacy has become deictic (Leu, 2000); the meaning of literacy is rapidly changing as new technologies for literacy continuously appear and new social practices of literacy quickly emerge. Historically, literacy has always changed. Today, however, new technologies and new social practices rapidly and repeatedly redefine what it once meant, in a simpler world, to be able to read, write, and communicate effectively.

To be literate today often means being able to use some combination of texting, Facebook, Google, foursquare, Google docs, Skype, Chrome, iMovie, Contribute, or any of thousands of mobile "apps." To be literate tomorrow will be defined by even newer technologies that have yet to appear and even newer social practices that we will create to meet unanticipated needs. Literacy has become deictic, indeed.

An important source of this change is the Internet. The Internet is the most efficient system in the history of civilization for delivering new technologies to read, write, and communicate (Lankshear & Knobel, 2006). It is also an amazingly efficient system for rapidly disseminating new social practices for the use of these technologies. The growth rate of Internet connectivity has been exponential. Nearly 30% of the world's population (in 2011, 1.9 billion individuals) use the Internet (*Internet World Stats: Usage and Population Statistics*, 2011). At the current pace, more than half of the world's population will be online by 2017, and most of the world will be online by 2025. Never in the history of civilization have we seen a new technology adopted by so many, in so many different places, in such a short period of time.

As a result, the deictic nature of literacy will quickly accelerate as even more individuals come online, creating even more technologies for literacy and evolving even more social practices, rapidly disseminating both over the Internet. The changing nature of literacy will be limited only by the capacity of humans to adapt to even newer literacies.

A Central Question: How Do We Conceptualize Literacy When It Has Become a Deictic Construct?

How should we conceptualize literacy when it is seemingly ephemeral? The answer is central to the study of literacy and, since literacy defines us, is central to our understanding of who we are. How we conceptualize literacy is also important to preparing each new generation for the literacies that will define their future. Thus, literacy defines both who we are and who we shall become. This is the central challenge to literacy in a deictic world generated by the Internet. As a result, it becomes essential to develop a precise definition for this construct, especially if we hope to study it systematically and improve both equity and access to literacy.

That literacy is changing can be seen in the fact that many scholars have recently sought to describe these changes (e.g., New London Group, 1996; Kress, 2003; Street, 2003; Lankshear & Knobel, 2006; Gee, 2007). Each attempted to describe an important aspect of the changing nature of literacy in a world in which many new social practices and new technologies are altering the traditional terrain of literacy, expanding it in important ways.

Some use the term *new literacies* to capture the new social practices of literacy that are emerging (Street, 2003). Rather than seeing new social practices emerging from new technologies, they tend to see new technologies emerging from new social practices. Others use the term to describe important new strategies and dispositions that are essential for online reading comprehension, learning, and communication (Henry, 2006; International Reading Association, 2009). Still others see new literacies as new discourses (Gee, 2007) or new semiotic contexts (Kress, 2003). Still others see literacy as differentiating into multiliteracies (New London Group, 1996) or multimodal contexts (Hull & Schultz, 2002), and some see a construct that juxtaposes several of these orientations (Lankshear & Knobel, 2006). When one includes terms such as *ICT literacy* (International ICT Literacy Panel, 2002) or *informational literacy* (Kuiper & Volman, 2008), the construct of new literacies becomes even broader. Indeed, just what new literacies means today is confusing; it depends on who uses it.

There is an opportunity to benefit from the richness of these different perspectives. Recognizing that changes are taking place at many levels and dissatisfied with these isolated attempts to capture those changes, some are beginning a collaborative approach to theory building (cf. Coiro, Knobel, Lankshear, & Leu, 2008), one that takes advantage of the power of multiple perspectives (Labbo & Reinking, 1999). This approach believes that the best solutions result from collaborative groups who bring diverse, multiple perspectives to problems (Page, 2007). The approach is based on *New Literacies* theory (Coiro et al., 2008; International Reading Association, 2009). New Literacies theory takes an open-source approach, inviting everyone who studies the Internet's impact to contribute to theory development and to benefit from others' contributions.

A Dual-Level Theory of New Literacies

New Literacies theory (Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009) works on two levels: uppercase (New Literacies) and lowercase (new literacies). *New Literacies*, as the broader concept, benefits from work taking place in the multiple, lowercase dimensions of *new literacies.* Lowercase theories carefully explore either a specific area of new literacies, such as the social communicative transactions occurring with text messaging (e.g., Lewis & Fabos, 2005), or a focused disciplinary base, such as the semiotics of multimodality in online media (e.g., Kress, 2003). Common findings across multiple perspectives are then included in the broader New Literacies theory.

This approach permits everyone to fully explore their unique, lowercase perspective of new literacies, while everyone also benefits from expanding their understanding of other, lowercase, new literacies perspectives. By assuming change in the model, everyone is open to a continuously changing definition of literacy, based on the most recent data that emerge consistently, across multiple perspectives, disciplines, and research traditions. Moreover, areas in which alternative findings emerge are identified, enabling each to be studied, again from multiple perspectives. From this process, common patterns emerge and are included in a larger, common, New Literacies theory.

What currently defines this larger theory of New Literacies? A recent review (Coiro et al., 2008) concludes that most lowercase new literacies perspectives share four elements:

1. New Literacies include the new skills, strategies, dispositions, and social practices that are required by new technologies for information and communication;
2. New Literacies are central to full participation in a global community;
3. New Literacies regularly change as their defining technologies and social practices change; and

4. New Literacies are multifaceted and our understanding of them benefits from multiple points of view.

Additional, common, elements will emerge as more work is completed at lower levels, informing all scholars who seek to understand the changes taking place to literacy.

The New Literacies of Online Reading Comprehension

The new literacies of online reading comprehension (Leu et al., 2009) is one example of a lowercase theory. This perspective frames online reading comprehension as a process of problem-based inquiry involving the new skills, strategies, dispositions, and social practices that take place as we use the Internet to solve problems and answer questions. At least five processing practices occur during online reading comprehension:

1. reading to identify important questions,
2. reading to locate information,
3. reading to critically evaluate information,
4. reading to synthesize online information, and
5. reading and writing to communicate online information.

Within these five areas reside the skills, strategies, and dispositions that are distinctive to online reading comprehension as well as others that are also important for offline reading comprehension.

Reading to Identify Important Questions

We read on the Internet to solve problems and answer questions. How a problem is framed or how a question is understood is a central aspect of online reading comprehension. Recent work by Taboada and Guthrie (2006) within traditional texts suggests that reading initiated by a question differs in important ways from reading that does not.

Reading to Locate Information

A second component of successful Internet reading is the ability to read and locate information that meets one's needs (International ICT Literacy Panel, 2002; Guinee, Eagleton, & Hall, 2003). The reading ability required to locate information on the Internet may very well serve as a gate-keeping skill; if one can not locate information, one will be unable to solve any problem. New online reading skills and strategies may be required, for example, to generate effective keyword search strategies (Kuiper & Volman, 2008); to read and infer which link may be most useful within a set of search engine results (Henry, 2006); and to efficiently scan for relevant information within websites (Rouet, 2006).

Reading to Critically Evaluate Information

A third component is the ability to critically evaluate information encountered on the Internet. Critically evaluating online information includes the ability to read and evaluate the level of accuracy, reliability, and bias of information (Burbules & Callister, 2000). This presents challenges that are quite different from traditional print and media sources. The content of online information is even more diverse and commercially biased and new sources of information about authors appear, requiring new strategies for their effective use.

Reading to Synthesize Online Information

Successful Internet use also requires the ability to read and synthesize information from multiple online sources (Jenkins, 2006). Synthesis requires the reader to bring together an awareness of the reading processes and an underlying understanding of the text. The Internet introduces additional challenges to coordinate and synthesize vast amounts of information presented in multiple media formats, from a nearly unlimited and disparate set of sources (Jenkins, 2006; Rouet, 2006).

Reading and Writing to Communicate Online Information

A fifth component of successful Internet use is the ability to communicate via the Internet to seek information or share what you have learned. Emerging research suggests that the interactive processes of reading and writing have become so intertwined on the Internet that they often happen simultaneously during communication (Coiro & Dobler, 2007). Moreover, each specific communication tool on the Internet is constituted differently and presents a range of new skills, strategies, and social practices to use them effectively (Coiro et al., 2008). New types of strategic knowledge are required, for example, to effectively participate and communicate in social networking environments such as email, blogs, wikis, and instant messaging (Leu et al., 2005; Lewis & Fabos, 2005).

What Do We Know About the New Literacies of Online Reading Comprehension?

Work is just emerging on the new literacies of online reading comprehension. As a result, we are merely discovering the outlines of what happens when we read online. What do we know? First, online reading comprehension appears not to be isomorphic with offline reading comprehension; additional reading comprehension skills seem to be required (Leu et al., 2005; Coiro & Dobler, 2007). One study, among sixth grade students proficient at using the Internet (Coiro & Dobler, 2007), found that online reading comprehension shared a number of similarities with offline reading comprehension, but online reading comprehension was also more complex and included notable differences. A second study found no statistically significant correlation between scores on a state reading comprehension assessment and an assessment of online reading comprehension with good psychometric properties (Leu et al., 2005). These data also suggest that additional skills are required for online and offline reading comprehension. A third study (Coiro, 2007), found that offline reading comprehension and prior knowledge contributed a statistically significant amount of variance to the prediction of online reading comprehension, but an additional 16% of independent variance was contributed by knowing students' online reading comprehension ability. Finally, case studies and videos of online reading show that students who perform low on state reading assessments, sometimes perform at unexpectedly high levels on tasks of online reading comprehension (Leu, Zawilinski, et al., 2007). Together, these results support the claim that additional skills and strategies may be required during online reading.

It is surprising to find that some struggling readers read well online (Castek, Zawilinski, McVerry, O'Byrne, & Leu, 2011). This suggests that the Internet may be a potentially supportive context for some struggling readers. Why might this be the case? Units of text are typically shorter online as readers follow informational links from one location to another seeking help in order to solve their informational problem. Shorter units of text are easier for struggling readers to process. In addition, online readers construct their own texts to read, as they choose different paths to follow. This increases engagement and makes it more likely that readers encounter text appropriate for their abilities. Also, online

texts contain multimedia, a traditionally supportive context for struggling readers. Finally, each Web page is really a graphic image and struggling readers are often quite skilled readers of information presented graphically.

There is also a third finding—that although adolescent "digital natives" may be skilled with social networking, texting, video downloads, MP3 downloads, or mashups, they are not always as skilled with online reading comprehension, including locating and critically evaluating information (Bennett, Maton, & Kervin, 2008). We may overgeneralize adolescents' ability to read online information effectively, from their ability to engage successfully with online social networking, texting, and video games.

What Do We Need to Know About the New Literacies of Online Reading Comprehension?

The answer to this question is simple: There is much we do not know so the need is great. We do not fully understand, for example, the reason that online and offline reading comprehension are not isomorphic. Several explanations are possible. Current results, showing a lack of correlation between the two may be due to the fact that online reading is a problem-based task while offline reading includes a wider range of comprehension tasks (cf. Taboada & Guthrie, 2006). Or, it may be that the reading skills required to locate information online are such bottleneck skills that students who lack this ability perform poorly online, even though they may be high performing offline readers. Or, greater levels of critical evaluation, typically required online, may be the source of the difference.

It is also likely that we can increase or decrease statistical relationships between online and offline reading comprehension by simply varying the nature of the online reading comprehension task. Online assessments that require richer, more complex use of online tools (search engines, email attachments, blogs, wikis), or more complex information spaces, may generate less of a relationship with offline reading comprehension compared to online assessments that simply require the reader to read information at a single Web site. So, it is still too early to claim that the lack of isomorphism between online and offline reading is either strong or weak. That it can be demonstrated appears to be the case, but we require much more work to be able to fully understand the conditions under which the two contexts for reading require different skills and strategies.

We also do not know very much about the relative contribution of various elements of online reading comprehension to successful online reading outcomes. It is likely that skill areas often required earlier in the process (locating and evaluating information) may be more determinative of successful performance than other areas, but we have not yet evaluated this claim.

In addition, we need research on the phenomenon reported above, that some struggling readers find the Internet to be a very supportive context for reading. Prevailing wisdom in schools is that these students are not "ready" for reading on the Internet. That may be precisely opposite of what should be done for these students.

Also, we need to develop new instructional models. It is likely that these models may require one-to-one computing contexts to facilitate rapid exchange of online reading comprehension skills and strategies among students, something that initial research (Leu et al., 2005) has discovered.

Finally, we require better assessments of online reading comprehension, ones that are not only reliable and valid but also practical, easy to administer and score, and provide immediately useful information to teachers. The ones we currently have appear to be valid and reliable but they were designed for research and, as a result, require extensive time to reliably score. Currently work is taking place that seeks this broader objective (Leu, Kulikowich, Sedransk, & Coiro, 2009).

The Internet Is a Literacy Issue, Not a Technology Issue

As we consider new definitions of literacy in a deictic world, it is essential to recognize that the Internet is a literacy issue not a technology issue. Most educational systems fail to recognize this point. As a result, they create unnecessary challenges and make it more difficult to prepare a new generation skilled in the use of online information. There are two ways in which this happens.

First, public policies and assessments in literacy currently help the rich get richer and the poor get poorer in developing the ability to read and use online information effectively. How does this happen? The poorest students in any nation have the least access to the Internet at home (cf. Cooper, 2004). Unfortunately, it is often the case that the poorest schools are also under the greatest pressure to raise scores on tests that have nothing to do with online reading comprehension (cf. Henry, 2007). No state assessment of reading in the US, for example, contains any item that measures the ability to read search engine results or evaluate the source of information appearing online for bias. In poorer schools, there is often little incentive to teach the new literacies of online reading comprehension because they simply are not tested. Thus students in the poorest schools become doubly disadvantaged: They have less access to the Internet at home, and schools do not always prepare them for the new literacies of online reading comprehension at school.

Now, consider students in the most privileged schools. Many children from advantaged communities have broadband Internet connections at home. As a result, teachers feel greater freedom to integrate the Internet into their curricula (Henry, 2007). Thus students in richer districts become doubly privileged: They have greater access to the Internet at home and they use it more often at school.

It is a cruel irony that students who most need to be prepared at school for an online age of information are precisely those who are being prepared the least. The problem stems from the fact that policy makers and educators do not yet see the Internet as a literacy issue; they see it as a technology issue.

Consider, also, a second problem, the lack of Internet integration with content curriculum. Typically, schools frame the Internet as a technology issue. This often leads to the following types of outcomes:

1. technology standards become separated from subject area standards,
2. instruction in Internet use is not taught in content classes but in a separate technology or media class,
3. someone other than the classroom teacher teaches online information use, and
4. online information and communication skills are assessed separately from subject area skills.

Greater segregation of the Internet from the content curriculum typically results; online information use is taught down the hall by someone other than the classroom teacher, often in a computer lab.

Now, consider the likely outcomes when the Internet is framed as a literacy issue:

1. technology standards become integrated within subject area standards,
2. instruction in Internet use is integrated into each subject area,
3. every classroom teacher is responsible for teaching online information and communication use, and
4. online information and communication skills are included in subject area assessments.

Clearly Internet integration with content instruction will happen faster when the Internet is defined as a literacy issue.

Literacy Is the Internet—the Internet Is Literacy

This entry began by pointing out the importance of defining literacy correctly, suggesting that literacy had become a deictic construct, largely because it increasingly takes place on the Internet. We outlined a collaborative approach to defining literacy as a deictic construct; a dual level theory of New Literacies.

It concludes by noting that not only is literacy the Internet, but that the Internet is literacy. These two aspects of our lives are, and will be, inseparable. Recognizing the tight link between literacy and the Internet is important if we hope to understand the nature of the literacies of today while we prepare students for the literacies of tomorrow.

SEE ALSO: Conceptualizing and Researching "New Literacies"; Critical Media Literacy; Literacy Practices in Virtual Environments; Reading and Intertextuality; Teaching Reading

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