Comments on Greenhow, Robelia, and Hughes

Expanding the New Literacies Conversation

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Using a popularized notion such as Web 2.0 limits research efforts by employing a binary construct, one initially prompted by commercial concerns. Instead, the authors of this article, commenting on Greenhow, Robelia, and Hughes (2009), suggest that continuous, not dichotomous, change in the technologies of literacy and learning defines the Internet. They argue that a dual-level theory of New Literacies is a productive way to conceptualize this continuous change, especially for education. They describe uppercase (New Literacies) and lowercase (new literacies) theories, using the new literacies of online reading comprehension to illustrate the process. They suggest this approach is likely to lead to greater equity, understanding, and acceptance of continuously new technologies within educational systems.

Keywords: literacy; new literacies; online reading comprehension; technology

The most profound influence on life in the 21st century may turn out to be the Internet. The Internet links us to the greatest repository of information in the history of civilization (Weare & Lin, 2000). It also provides multiple modes of communication (Thorne, 2008). Finally, it is the most efficient system in our history for delivering new technologies to read, write, and communicate (Lankshear & Knobel, 2006). Together, these elements permit individuals to construct new information, new knowledge, and even newer technologies. As a result, the Internet is in a continuous state of becoming, regularly transforming each one of us as we, in turn, transform it.

The speed of this change has been breathtaking. More than 1.5 billion individuals use the Internet ("Internet World Stats: Usage and Population Statistics," 2008). At the current pace, more than half of the world's population will be online in 7 years, and most of the world will be online in 10 to 15 years. 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 time.

The impact of the Internet may also be tracked through research it has prompted; scholars from many disciplines have explored its implications. They include anthropology (Borzekowski, Fobil, & Asante, 2006), foreign affairs (Bleha, 2005), economics (Matteucci, O'Mahony, Robinson, & Zwick, 2005), cognitive science (Mayer, 2005), sociolinguistics (Cope & Kalantzis, 1999; Gee, 2007; Kress, 2003), cultural anthropology (Hine, 2000), information science (Bilal, 2000), law (Lessig, 2005), rhetorical studies (Starke-Meyerring, 2005), and educational technology (Dede, 2007; Greenhow, Robelia, & Hughes, 2009). Moreover, the Internet has prompted the development of entirely new disciplines, such as social informatics (Kling, 1999), and new research methods, such as virtual ethnography (Hine, 2000).

Finally, the Internet is altering nations around the world (Friedman, 2006). Governments seek to transform their societies through public policies that exploit the educational potential of the Internet (Gu, Liu, & Lin, 2004; Leu & Kinzer, 2000).

What Should an Understanding of the Internet Be an Understanding Of?

Given the Internet's transformative potential, a critical question is, How should research be conceived to advance our understanding of the teaching and learning potentials of the Internet? Here, we consider the work of Greenhow, Robelia, and Hughes ("Web 2.0 and Classroom Research: What Path Should We Take *Now?*" in this issue of *Educational Researcher,* pp. 246–259.) in relation to this question.

Although the authors conducted a comprehensive review of how people use online communication technologies, primarily in out-of-school settings, we feel there are at least four limitations to their approach:

1. *The analysis is conceptually limited.* It is based on a binary distinction between Web 1.0 and Web 2.0, a construct that many have criticized for its conceptual inadequacies (see Anderson, 2007; Barbry, 2007). We will not repeat those arguments. We believe, however, that the authors have missed an essential point: Continuous, not dichotomous, change defines the Internet and the skills it requires (Coiro, Knobel, Lankshear, & Leu, 2008; Leu, 2000). We require constructs that recognize the continuously changing nature of the Internet, a deictic phenomenon that is the central issue for education now, and in the future.
2. *The analysis is directionally limited.* The authors frame their analysis within an ecological perspective but appear to suggest that social lives with online tools, outside of school, should direct the integration of new technologies within school. Although it is clear that adolescents live increasingly rich online lives outside of school (Alvermann, 2004; Hagood, 2008), a unidirectional analysis ignores

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important resistance to technologies from schools (Cuban, 2001; Hodas, 1993). In-school and out-of-school relationships need to be considered transactionally if we expect new technologies to be adopted in school settings.

3. *The analysis is contextually limited.* It suggests that schools should change because adolescents use online technologies at home and in mobile contexts. We agree schools must change, but the somewhat narrow dimensionality of this work does not permit the rich and complex picture we require to direct such an important issue. Certainly, we should also include the nature of technology use in workplace settings, for example, as we consider technology preparation in school.
4. *The analysis is technologically limited.* The analysis is based on communication technologies and largely avoids information technologies. We believe both are essential for learning in school settings. Any analysis based on one, and not the other, is theoretically weak by definition.

We believe that a more productive theoretical approach is to view the Internet as a literacy issue, not a technology issue, framing it in ways that make sense for the study of both out-of-school and in-school literacy practices. Framing Internet use as a literacy issue will also make it more likely to be embraced by schools, an institution resistant to adopting new technologies (Cuban, 2001; Hodas, 1993). Finally, framing the Internet as a literacy issue will permit researchers to integrate analyses of the online reading of information with online writing, media construction, and communication, providing a richer understanding of how the Internet should be used in school settings.

Framing the Internet as a Literacy Issue

Some are beginning to look past the technological aspects of the Internet to analyze the underlying social practices it serves (Lankshear & Knobel, 2006; Leander, 2008; Street, 2003). This helps the research community to see the Internet not as a technology but rather as a context in which to read, write, and communicate. The Internet is no more a technology than is a book; its functional affordances define it more than its technological affordances.

Framing the Internet as a literacy issue, instead of a technology issue, is not a trivial matter for education. It is likely to lead to these types of policies:

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.

Framing the Internet as a technology issue is likely to lead to a less productive set of policies:

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 effective communication; and
4. Online information and communication skills are assessed separately from subject area skills.

We believe framing the Internet as a literacy issue will speed Internet integration into the classroom and avoid the resistance to technological innovations common to schools (Cuban, 2001; Demetriadis et al., 2003; Hodas, 1993).

Recognizing the Internet as a literacy issue has prompted individuals from many disciplines to begin a collaborative approach to theory building (cf. Coiro et al., 2008). This approach is coming to be referred to as New Literacies theory (Coiro et al., 2008; International Reading Association, 2002, 2009). It takes an open-source approach to theory development, at the highest level, inviting everyone who studies the Internet's impact on our literacy lives to contribute to theory development and to benefit from others' contributions.

The New Literacies of the Internet and Other Information and Communication Technologies (ICT): A Dual-Level Theory

New literacies means many different things to many different people. To some, new literacies are seen as new social practices (Street, 1995, 2003). Others see new literacies as important new strategies and dispositions essential for online reading comprehension, learning, and communication (Castek, 2008; Coiro, 2003; Henry, 2006; Leu, Kinzer, Coiro, & Cammack, 2004). Still others see new literacies as new discourses (Gee, 2007) or new semiotic contexts (Kress, 2003; Lemke, 2002). 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 these different definitions of new literacies with terms such as *ICT literacy* (International ICT Literacy Panel, 2002) or *informational literacy* (Hirsh, 1999; Kuiper & Volman, 2008; Webber & Johnson, 2000), the construct of new literacies becomes even broader. In this breadth, however, there is an opportunity to benefit from the richness of these different perspectives as the research community develops richer theory to direct our collective understanding of Internet use in school settings.

New literacies theory (Coiro et al., 2008; Leu et al., 2004) works on two levels: uppercase (New Literacies) and lowercase (new literacies). *New Literacies*, as the broader, more inclusive concept, benefits from work taking place in the multiple lowercase dimensions of *new literacies.* This is seen as an advantage, not a limitation. It enables the larger theory of New Literacies to keep up with the richness and continuous change that will always define the Internet. Lowercase theories explore either a specific area of new literacies, such as the social communicative transactions occurring with text messaging (e.g., Lam, 2006), or a focused disciplinary base, such as the semiotics of multimodality in online media (e.g., Kress, 2003). Each body of work contributes to the larger, continually changing theory of New Literacies.

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

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

As work at the lower levels continues, it will add new dimensions and depth to an understanding of the larger construct of New Literacies.

The New Literacies of Online Reading Comprehension

As one example of how a lowercase theory of new literacies informs the uppercase theory, consider the new literacies of online reading comprehension (Leu et al., 2004; Leu, Zawilinski, et al., 2007). 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. It is grounded in several different theoretical perspectives: sociocultural theory, cognitive theory, reading comprehension theory, and information theory.

What differs from earlier models of traditional print comprehension is that the new literacies of online reading comprehension are defined by a process of self-directed text construction (Coiro & Dobler, 2007; Leu, Zawilinski, et al., 2007), with at least five processing practices required when reading on the Internet: (a) reading to identify important questions, (b) reading to locate information, (c) reading to evaluate information critically, (d) reading to synthesize information, and (e) reading and writing to communicate information. Within these five areas reside the skills, strategies, and dispositions that are distinctive to online reading comprehension as well as others that are important for offline reading comprehension.

Another difference from earlier models of print comprehension is the inclusion of communication within online reading comprehension. Online reading and writing are so closely connected that it is not possible to separate them; we read online as authors and we write online as readers (Huffaker, 2004, 2005; McVerry, 2007; Zawilinski, 2009). Thus online reading comprehension includes the online reading and communication skills required by texting, blogs, wikis, video, shared writing spaces (such as Google Docs), and social networks, such as nings (Boyd & Ellison, 2008; Forte & Bruckman, 2006; Lewis & Fabos, 2005).

Research in the new literacies of online reading comprehension has provided the broader New Literacies research community with a number of useful insights:

1. Online reading comprehension is not isomorphic with offline reading comprehension; additional reading comprehension skills are required (Coiro, 2007; Leu et al., 2005; Leu, Zawilinski, et al., 2007).
2. Challenged readers who possess online reading comprehension skills may read online better than do students who perform at higher levels with offline reading comprehension but lack online reading skills (Leu, Zawilinski, et al., 2007).
3. Prior knowledge may contribute less to online reading comprehension than to offline reading comprehension, because readers often gather required prior knowledge online as part of the reading paths they follow (Coiro, 2007).
4. A taxonomy of online reading skills is emerging from think-aloud, verbal protocols by skilled online readers (Leu, Reinking, et al., 2007).
5. Valid and reliable assessments of online reading comprehension have been developed (Castek, 2008; Coiro, 2007; Henry, 2007; Leu et al., 2005).
6. Although adolescent "digital natives" may be skilled with social networking, texting, video downloads, MP3 downloads, and mash-ups, they are not generally skilled with online information use, including locating and critically evaluating information (Bennett, Maton, & Kervin, 2008; Leu, Reinking, et al., 2007).
7. Students appear to learn online reading comprehension skills best from other students within the context of challenging activities designed by the teacher (Castek, 2008).

These findings are important as nations consider realigning public policies in education with the challenges of global competitiveness and information economies. State reading standards and state reading assessments in the United States, for example, have yet to include any online reading comprehension skills. This, despite the fact that several international assessments have already begun to do so, such as the Programme for International Student Assessment (PISA) and the Programme for the International Assessment of Adult Competencies (PIAAC). Moreover, the following observations have not changed since they were first made several years ago (Leu, Ataya, & Coiro, 2002):

1. Not a single state in the United States measures students' ability to read search engine results during state reading assessments.
2. Not a single state in the United States measures students' ability to evaluate critically information that is found online to determine its reliability.
3. No state writing assessment in the United States measures students' ability to compose effective e-mail messages.
4. Few, if any, states in the United States permit all students to use a word processor on the state writing assessment.

Finally, the framework for the 2009 National Assessment of Educational Progress in reading, the supposed "gold standard" for assessment in the United States, failed to include any online reading comprehension skills, suggesting that these skills will not be assessed nationally until the next iteration in 2019 (Leu et al., in press).

Work in the new literacies of online reading comprehension is only beginning; it has yet to take full advantage of the insights from other lowercase areas of new literacies research. The work in the many definitions of new literacies is so new that scholars in the different areas have yet to become fully acquainted with one another's work. Doing so is essential if new literacies researchers are to build together a broader, uppercase theory of New Literacies sufficiently rich and complex to inform work at the lowercase level.

Work in the new literacies of online reading comprehension, for example, has yet to take full advantage of work in the semiotics of visual images (Kress, 2003; Lemke, 2002) or work exploring the full use of the newest social networking tools (Zawilinski, 2009), video (O'Byrne, 2008), and the many other overlapping new media forms that increasingly dominate online life.

Current Public Policies May Help the Rich Get Richer and the Poor Get Poorer

Although work within the new literacies of online reading comprehension has yet to explore fully all aspects of online reading comprehension, it points to a serious concern for any society based on egalitarian principles: U.S. public policies in reading may serve to increase achievement gaps, not close them (Leu et al., in press).

How does this happen? Children in the poorest school districts in the United States have the least amount of Internet access at home (Cooper, 2004). Unfortunately, the poorest schools are also under the greatest pressure to raise scores on tests that have nothing to do with online reading comprehension (Henry, 2007). There is little incentive to teach the new literacies of online reading comprehension because they 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. Cooper (2004) indicates that most children from advantaged communities have broadband Internet connections at home. As a result, teachers feel greater freedom to integrate the Internet into their curricula and support students in using it (Henry, 2007); it is easy to assign homework requiring Internet use when one knows that students have Internet access at home. Lazarus, Wainer, and Lipper (2005), for example, found that 63% of children from households earning more than $75,000 annually reported that they used the Internet at school, compared with only 36% of children from households earning less than $15,000 annually. 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 the cruelest irony of No Child Left Behind that the students who most need to be prepared at school for an online age of information are precisely those who are being prepared the least. This public policy failure has important consequences for education because the Internet is now a central source of information, and learning is dependent on the ability to read and comprehend complex information at high levels (Alexander & Jetton, 2002; Bransford, Brown, & Cocking, 2000).

Concluding Thoughts

We have argued for the importance of good theory building to inform the understanding of Internet use in schools. We also believe that one needs to recognize schools' traditional resistance to new technologies (Cuban, 2001; Demetriadis et al., 2003; Hodas, 1993). Framing the Internet as a literacy issue will enable schools to accommodate more easily its entry, and the entry of other ICTs, into the curriculum.

It is essential to build a sustainable research base in this area by including all of the different lines of research that are currently developing. To accomplish that end, we suggest that a dual-level theory of new literacies is beginning to emerge, operating at the highest level (New Literacies) as a supportive context for establishing common patterns across work taking place within more specific areas (new literacies). This permits everyone to exploit fully the diversity in theory development and research and inform their own works as different research communities build a larger, richer, more complex theory of New Literacies together.

Finally, we described one of many areas of work taking place within a lowercase definition of new literacies, the new literacies of online reading comprehension. We indicated how this work can improve troubling flaws in current public policies surrounding reading, improving opportunities for all students.

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