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# New Literacies, Reading Research, and the Challenges of Change: A Deictic Perspective

**Donald J. Leu**  
*University of Connecticut*

I consider myself incredibly privileged; my work has allowed me to develop far more questions than answers. This, of course, is a result of what some might call the First Principle of Reading Research: The more we study something, the more we realize how little we understand. Today, I want to share some of my questions with you and a few of the possible answers.

Of course, it is a little unsettling to be so incredibly privileged, having so many questions, as one begins a presidential address at NRC. I take comfort, however, in what might be called the corollary to the First Principle of Reading Research; it may apply to some of us here: If you have not yet experienced the First Principle of Reading Research, you are in far greater trouble than I am!

## COLLEAGUES TO WHOM I AM INDEBTED

First, though, I want to acknowledge those individuals in my life who have encouraged me to ask important questions, not trivial ones, and those who have helped to shape the questions that I explore today. I do not have time to mention all of these significant, Bakhtinian, others but they include: my mother and father, my wife Debbie and our daughters Caity and Sarah, Jeanne Chall (who started me on this journey), Herb Simons and Bob Ruddell (who prepared me), Chuck Kinzer, Lee Gunderson, Sandy Murphy, my former Syracuse family, my new family at the University of Connecticut, especially the members of the New Literacies Research Team (Erica Berg, Donna Bone, Jill Castek, Julie Coiro, Kent Golden, Doug Hartman, Laurie Henry, Teri LeBel, Athena Lentini, Mark Olson, Mary Truxaw, and Lisa Zawilinski), Bridget Dalton, Colin Lankshear, Michele Knobel, Colin Harrison, Dave Reinking and his research team at Clemson University, Jonna Kulikowich, and most especially each and every member of NRC, a research community that has taught me the most important lesson of my professional life: Ask important questions.

## CENTRAL QUESTIONS

Now, let me begin by asking two important questions that frame this talk. I will argue that they are causally connected: (a) Why do schools *not* prepare students for the new literacies of the Internet, especially in the U.S. and especially in economically challenged school districts?; and (b) Why do literacy researchers *not* focus their attention on the new literacies of the Internet, helping schools to prepare students for their literacy futures?

Some of us who are here today do not believe these questions to be central to their work or, indeed, even important to the larger work of the literacy research community. In this talk, I will argue that this type of thinking is dangerous; it will lead literacy researchers to become increasingly marginalized during the important public policy debates that lie ahead, losing the opportunity to

influence events that will take place in school classrooms. If this happens, we will have only ourselves to blame.

Some of us who are here today believe that they do not study technology issues and, thus, have little to say about either question. I will argue that you cannot study reading or literacy without studying technology. To think otherwise is not to understand the nature of reading, literacy, or technology.

Some of us who are here today might suggest that reading is the same on the Internet as in a book. I will present data that raises questions about this conclusion.

Still others who are here today might suggest that the answer to the first question lies in the hegemonic interests of those in positions of power. That may be partially true. I think, however, that such a response ignores our responsibility as literacy researchers.

I believe that the answer to the first question may be found in the second; as researchers, we have failed to provide the educational community with adequate theory and research on the new literacies that the Internet and other ICTs require. As a result, students are seldom supported in developing these new literacies in school. *This is especially true for those students who require our support the most—those who have access to the Internet at home the least.*

Our response to these questions is an important one. If we do not see the Internet as a literacy issue, others, who are outside the literacy research community, will fill this vacuum and define online reading, writing, and communication for us and without us. Research communities in assessment (International ICT Panel, 2002), library and media studies (American Association of School Librarians & Association for Educational Communications and Technology, 1998), educational technology (International Society for Technology in Education, n.d.), and learning research communities (Partnership for 21st Century Skills, 2003) are already beginning to do so. If this trend continues, we will be left alone to study reading issues defined by our past, not our future and, once again, the reading research community will be left out of important public policy decisions that affect classrooms, teachers, and students.

The causal relationship between the two questions that I use to frame this talk is a very complex one. To understand some of the complexities, I organize my talk around five ideas, raising important questions for us to consider as I go: a) the Internet is this generation's defining technology for literacy and learning; b) the Internet is a literacy issue, not a technology issue; c) new literacy skills, strategies, and dispositions are required to use the Internet effectively; d) to fully understand the issue of new literacies, we must recognize that literacy has become a deictic construct; and e) only when each of us brings our special expertise to studying literacy on the Internet can we expect students to fully realize their own potential as global citizens of the 21st century.

#### THE INTERNET IS THIS GENERATION'S DEFINING TECHNOLOGY FOR LITERACY AND LEARNING

We are about to mark an important milestone in the history of literacy. Quite possibly this week, perhaps even during this talk, someone on our planet will become the 1,000,000,000th individual to acquire Internet access (de Argeaz, 2006; Internet World Stats: Usage and Population Statistics, n.d.)

One-sixth of the world's population is now reading online in Internet cafés, homes, and businesses in locations such as Jakarta, Alice Springs, Soweto, Cartagena, Novosibirsk, Kyoto, Barrow, and many others. These Internet readers read in new and powerful ways as they construct meaning from their reading experiences on the Internet. They almost always begin their reading with a problem or question they are trying to answer. Then they use prior knowledge to generate key words in a search engine, read the search engine results that appear, making inferences about the best site to visit. They also critically evaluate information that they encounter, synthesize information across texts and images, communicate to others what they have learned, and continuously construct meaning as they read and write websites, IMs, email, blogs, wikis, and many other ICTs. One billion readers are reading online. One billion writers are communicating online with others around the world. One billion members of our global community are redefining what it means to be literate.

The rate of this growth has been staggering; most of it has occurred during the past five years (Evolution of Online Linguistic Populations, n.d.). At this pace, nearly half of our entire global community will be reading online in another five years and Internet access will be nearly ubiquitous sometime thereafter. These rapid changes in the nature of reading have profound consequences that our research community can no longer ignore.

The changes in how the global community reads are mirrored in the US, especially as we look at data on Internet use within school settings, homes, and the workplace. Profound changes, for example, have taken place in schools during the past decade. In 1994, only 35% of public K-12 schools in the US had an Internet connection; today 99% do (Parsad, Jones, & Greene, 2005). In 1994, only 3% of all K-12 classrooms in the US had Internet access; today 93% do (Parsad, Jones, & Greene, 2005). Of course, increasing Internet access does not necessarily mean that students are being taught the skills necessary to read and think critically about the information that they locate online. Later, I will argue that this is one of the greatest challenges we face in the years ahead.

Changes in our schools have also taken place in our homes. In 2004, nearly 75% of all households in the U.S. had Internet access (Nielsen/Net Ratings, 2004). Eighty-seven percent of all students between the ages of 12 and 17 in the U.S. report using the Internet; nearly 11,000,000 do so daily (Pew Internet and American Life Project, 2001). In addition, more than 90% of students between the ages of 12 and 17, with home access to the Internet, report using the Internet for homework and over 70% used the Internet as the primary source for information on their most recent school report or project (Pew Internet & American Life Project, 2001). Interestingly, only 24% reported using the library for the same task (Pew Internet & American Life Project, 2001) and Internet users report decreasing time spent viewing television while increasing time spent online (Lebo, 2003).

The nature of reading, writing, and communication have also been rapidly changing in the workplace as economic units seek to meet global economic competition by becoming more productive (Bruce, 1997; Mikulecky & Kirkley, 1998; The New London Group, 2000). In 2005, 93% of workers in the U.S. in companies with more than 100 employees reported using the Internet and other online information resources in the workplace (Harris Interactive Inc., 2005).

More broadly based survey data from the United States from several years earlier document the rapid increases in Internet use in the workplace. In just one year (August 2000 to September 2001), use of the Internet at work to read, write, and communicate increased by nearly 60%

among all employed adults 25 years of age and older, from 26.1% of the workforce to 41.7% (U.S. Department of Commerce, 2002). While workers in positions with the highest levels of education reported the highest levels of Internet use (80.5% of workers in managerial positions reported using the Internet), more than 70% of workers reported using the Internet who were in technical, sales, and administrative support positions (U.S. Department of Commerce, 2002).

To illustrate how rapidly changes are taking place to our literacy and learning worlds, let me introduce you to a somewhat new Internet technology, iSight video conferencing. I also want to introduce you to Tim Lauer, the principal at Meriwether Lewis Elementary School in Portland, Oregon. Tim is an expert on blogging in schools and will show us several examples of teachers who are using blog technologies. Tim, by the way, uses a blog to organize his own school's website (<http://lewiselementary.org/>).

(Tim's portion of this address may be viewed, within a video of the entire talk at [http://www.newliteracies.uconn.edu/nrc/don\\_leu\\_2005.html](http://www.newliteracies.uconn.edu/nrc/don_leu_2005.html).)

Tim shows us some of the opportunities for schools that seek to integrate the Internet into classrooms. Currently, however, more Internet use is taking place outside of school by our students, than takes place inside school (Rainie & Hitlin, 2005; Internet Reading Research Group & New Literacies Research Team, 2006).

Recent work by Alvermann (2002); Chandler-Olcott & Mahar (2003); Gee (2003); Jacobs (in press); Leander & McKim (2003); Lewis & Fabos (2005); Wilber (in press); Lankshear & Knobel, (2003); and Steinkuehler, Black, & Clinton (2005) has established that students experience important literacy lives online, outside of school. Often teachers are unaware of this and, most importantly, are unaware of how to integrate these new literacies into the classroom (Chandler-Olcott & Mahar, 2003). Unfortunately, few studies have investigated the use of the Internet in classrooms for literacy and learning. One of the few to do so (Karchmer, 2001) found that teachers who were exemplary at using the Internet in their classrooms viewed the Internet more as a technology, not a literacy, tool.

The Internet is infrequently integrated into classroom reading, writing, language arts, or English classes. As a result, despite widespread use outside of school, not all students have been able to experience these new literacies. Those students who are fortunate enough to experience new literacies often come from more privileged contexts and engage in these online practices more at home than at school.

As a research community, our challenge today is to determine how best to integrate the new literacies of the Internet into reading, writing, language arts, and English classrooms, helping all students to realize their potential. Unfortunately, however, nearly all of our research in this area has only looked at new literacies in out of school contexts, largely among adolescents. We have little research on the classroom use of the new literacies of the Internet; we know little about how to best integrate them into the full range of classroom literacy programs.

This challenge is even greater when you realize the systemic changes that we require for change to take place. We require teachers who are literate themselves with these new literacies, school leadership teams who understand why it is essential to integrate the Internet into literacy education, state reading and writing standards that include new literacies in their lists of essential skills, state reading and writing assessments that measure new literacies, and reading and writing curriculum

that provide instructional support in how best to integrate new literacies into classroom lessons. The challenges we face are important ones; they require our best research to determine how to navigate the complex path that we must travel. Some nations, though, are already far along this path.

Let me illustrate this with a series of questions. See how many you answer correctly:

1. Which nation currently manufactures the most software in the world?  
*Ireland.*  
(Hanluain, 2001; Harris, 2003; Organization for Economic Development and Cooperation, 2004)
2. Which nation provides all teachers with 5 weeks of paid, release time professional development at integrating the Internet into the classroom, using a national training model?  
*Finland.*  
(Finland Ministry of Education, 1998; R. Svedlin, personal communication, January 8, 1998)
3. How many states in the U.S. permit any student to use a word processor, should they choose to do so, on their state writing assessment?  
*None.*  
(Leu, Ataya, & Coiro, 2002)
4. According to a study conducted in Massachusetts, almost five years ago, how many more students will pass the Massachusetts state writing assessment when students are permitted to use a word processor?  
*19%*  
(Russell & Plati, 2001)
5. According to a recent article in *Foreign Affairs*, which nation has broadband in nearly every home that is 16 times faster than the broadband in US homes for \$22 per month?  
*Japan*  
(Bleha, 2005)
6. Which national government, bordering on the U.S., has established a national policy to ensure that every citizen and every school has access to an Internet connection?  
*Mexico*  
(Ludlow, 2006)
7. Where is one of the fastest-growing companies located that provides academic tutoring services in the U.S.?  
*India*  
(Friedman, 2005; Rai, 2005)
8. Which two nations have what might arguably be called the finest national Internet portal site for educators, providing extensive resources for teachers, students, parents, and others? (I note that the U.S. does not yet have one.)  
*Canada* ([www.schoolnet.ca](http://www.schoolnet.ca))  
*Australia* ([www.edna.edu.au/](http://www.edna.edu.au/))

9. How many states in the U.S. evaluate the online reading comprehension of search engine results or the ability to critically evaluate information at a web site?  
0  
(Leu, Ataya, & Coiro, 2002)
10. How many states in the U.S. measure students' ability to compose clear and effective email messages in their state writing assessment?  
0  
(Leu, Ataya, & Coiro, 2002)

You can see that our literacy lives are changing in fundamental ways as the Internet makes our world flat (Friedman, 2005), leveling the playing field for nations in ways not previously possible. Nations like Ireland, Finland, Canada, Australia, India, The Republic of Korea, and others are much farther along on their journey than others in establishing public policies to prepare their students for the new literacies of the twenty-first century. Asking why schools in the US have not fully integrated the new literacies of the Internet into reading, language arts, English, and content area classes is not a trivial question in a globalized world of information and communication.

Consider our most challenged schools in the U.S., where an especially pernicious effect of No Child Left Behind (NCLB) is taking place in urban, largely minority, districts. Because of traditionally low patterns of reading performance, these districts face greater pressure to achieve adequate yearly progress on tests that have nothing to do with online reading. As a result, they must focus complete attention on the instruction of traditional literacies abandoning any instruction in: searching for online information, critically evaluating online information, synthesizing online information, or communicating online. *It is the cruelest irony of NCLB that students who need to be prepared the most for an online age of information are precisely those who are being prepared the least.*

### THE INTERNET IS A READING AND LITERACY ISSUE, NOT A TECHNOLOGY ISSUE

We tend to forget our historical roots. Many literacy researchers and educators, for example, distance themselves from technology, forgetting that books ARE a technology, just as pencils are and just as the Internet is. Our close association with books and other traditional print media for over 500 years has generated the belief that books are not a technology but that digital tools are, like computers and the Internet. We forget how revolutionary a set of technologies the printing press was when it first appeared in the mid 1400s and how printed books were initially resisted because they represented a completely new technology for reading and writing. Gutenberg, after all, effectively became bankrupt and was forced to sell his printing press and the many new technologies that he invented (Manguel, 1996).

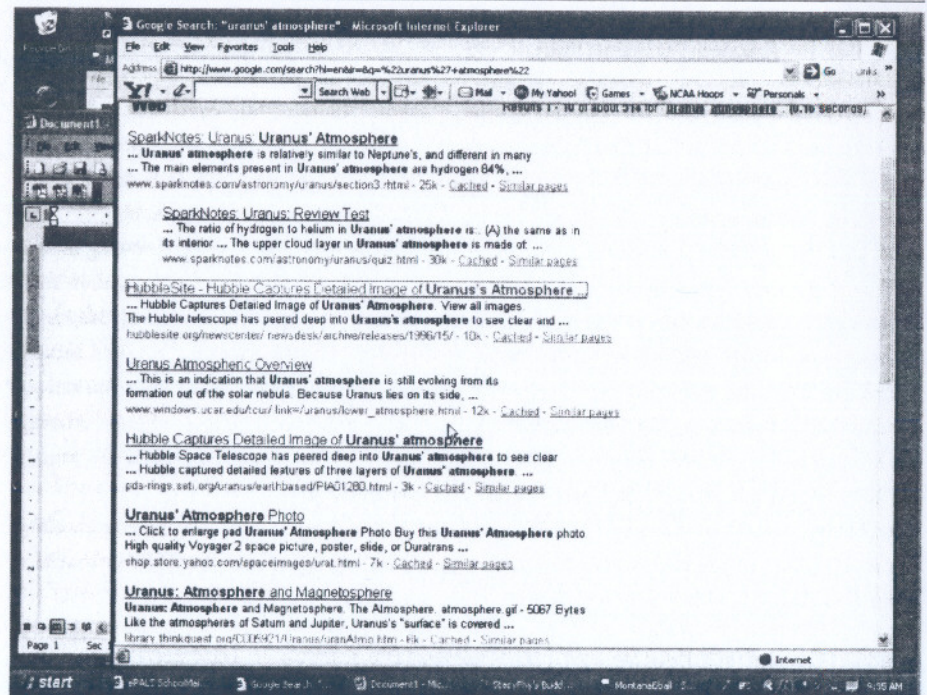
Literacy historians such as Manguel (1996) and Mathews (1966) remind us that the most important informational technology in each historical period has always been central to defining the nature of literacy, in conjunction with the social practices that each technology supports. This was true of cuneiform technologies, papyrus scrolls, velum technologies, hand illuminated bibles,

books, and the Internet. Each technology has required new literacies to unlock its literacy potential; each technology has generated new social practices of literacy.

If our technologies define our literacies, what does online reading comprehension look like? Let's watch one student who is reading online.

This is a video of everything that takes place on a computer screen as a highly proficient 7th grade online reader reads on the Internet. The video is created by a software tool, Camtasia, that we use in some of our research. This tool allows us to simultaneously capture what takes place on the screen during online reading protocols while also recording students' think aloud behavior, an approach we take in work to study the processes of online reading comprehension (Coiro, 2006; Leu & Reinking, 2005; The New Literacies Research Team, 2005).

**Figure 1.** A video illustrating the nature of online reading comprehension including: identifying a question, locating information, critically evaluating information, synthesizing information, and communicating. View this video at <http://www.newliteracies.uconn.edu/nrc/onlinereading.html>. You may require QuickTime, a free plug in available at <http://www.apple.com/quicktime/download/mac.html>.



This student has been given a problem to solve in an IM message from one researcher at the university. (Another researcher sits next to the student, taking field notes in an IM conversation with the university researcher.) The student was first asked to select a planet and use the Internet to find out something about its atmosphere. She selected Neptune and discovered that Neptune had clouds. Then she was asked to select another planet and compare this fact about Neptune's atmosphere to

the new planet that she selected—Uranus. She used a search engine to locate information on Uranus' atmosphere and is now reading this page to determine if Uranus has clouds.

Our work has shown that online reading comprehension almost always begins with a question or problem to solve; it is why we use the Internet—to answer questions or solve problems. Then we read to locate information, critically evaluate the information we locate, synthesize information from multiple sources, and communicate information. These five functions define the online reading comprehension process. While these five functions are not new, new reading strategies within each area are often required to take advantage of the affordances in the informational space that is the Internet. In addition, the nature of online reading comprehension changes because a number of traditional functions, such as locating information, critically evaluating information, and synthesizing information, become much more important in an informational space that is nearly unlimited, where anyone can publish anything and where we often have to construct a synthesis of meaning from multiple, disparate sources.

This student has already focused on the questions that drive this reading experience and has used a search engine to locate a useful resource. Now you see her trying to locate information about whether or not Neptune has clouds in its atmosphere. You see on the video that she skips more information than she reads, since she is reading to locate the answer to the question that drives her reading. She skims until she sees the heading, "Uranus' Clouds." She concludes, tentatively, simply from this heading that Uranus has clouds and sends this information by IM, along with a quick copy and paste of the URL for the location where she discovered this fact, showing how communication often takes place during online reading comprehension. Notice, though, that this reader also thinks critically about the information that she finds on the Internet. Knowing how to read search engine results, she returns to the initial set of results and reads this information for a second site that might be used to confirm her initial conclusion. Notice, too, that she actually reads the information about each search engine result, something that few adolescents do, often because they do not have the online reading skills required to comprehend information within this unique textual form. Instead, less proficient online readers typically use a simple "click and look" strategy, starting with the first result and looking at each web page, working their way down the page of search engine results (Guinee, Eagleton, & Hall, 2003; Henry, 2006).

Finally, notice her revealing IM message at the end, telling us why she prefers checking information on the Internet to an older technology: "Well you could also check the information with a book but that wastes too much time."

Clearly the example shows that Internet use is very much a reading and writing issue, not simply a technology issue. We read when we use the Internet; we write when we use the Internet. Moreover, we can see some of the rapid decisions that are made as this student quickly samples and evaluates text and images and works with multiple windows as she simultaneously reads and writes across the informational problems she faces.

I hope each of us may see issues that are interesting and important in this short episode. Critical theorists may wonder if the student considered who created each site and how this might have shaped the information they provide. Adolescent literacy scholars might find useful insights about how to view their own work in content areas in new ways. Or, some of us may be surprised

by how this student privileges information on the Internet over books, an interesting thought about our future if we fail to pay attention to the changes that are taking place.

Why do literacy researchers continue to view the Internet as something outside of our own research domain? There is not a single answer to this important question; it rests with each of us who has not yet brought our important expertise to the study of online reading, writing, and communication. If our field does not bring our expertise to study the nature of literacy in online contexts, others will quickly fill this void. As a result, the research base about the nature of reading comprehension, developed over generations, will be largely ignored as other constructs and literatures are used to redefine the nature of literacy. We have a simple choice: We can do this work or we can allow others to do it. I prefer that we do it. Why? The Internet is a reading issue; the Internet is a literacy issue.

#### NEW LITERACY SKILLS, STRATEGIES, AND DISPOSITIONS ARE REQUIRED TO USE THE INTERNET EFFECTIVELY

There are some scholars who continue to believe that there is no real difference between reading a book and reading online. This may be true. It is certainly true if one were to compare the reading of a page from a book to the reading of the same page, from the Internet, displayed on a computer screen.

Reading comprehension on the Internet, though, is seldom limited to the reading of a single screen. We use the Internet to answer questions, both large and small. Because online reading is typically driven by a question, it also requires locating information, perhaps by using a search engine and reading the results or by reading and navigating a web page to locate the links that will provide the answer. Along the way there may be critical evaluation of information, synthesis of disparate information resources, and communication, as readers seek information from others or as they communicate what they have discovered to others. On the Internet, reading comprehension begins with a question and often ends with communication. This is different from reading a book, especially in school classrooms where reading ends with a question, often from the teacher.

There are certainly some elements that overlap between the two types of reading. I will argue, though, that there are many important differences between the two. For now, though, let's just consider the simple case of fluency.

Typically both theoretical and operational definitions of fluency assume that you read every single word. On the Internet, however, fluency means just the opposite; fluency on the Internet means NOT reading every single word as you skip over text to get to the information you seek. On the Internet, knowing what NOT to attend to is far more important than knowing what to attend to (Lankshear and Knobel, 2003). We just saw this in the Camtasia recording of a student reading on the Internet.

While offline and online reading comprehension share similarities, there are also important differences. Both the International Reading Association (2002) and The Rand Reading Study Group (2002) have recognized that these differences exist. The Rand Reading Study Group concluded, "accessing the Internet makes large demands on individuals' literacy skills; in some cases,

this new technology requires readers to have novel literacy skills, and little is known about how to analyze or teach those skills.” (p. 4)

Some, who believe that there are important differences taking place to literacy online, have come to use the term new literacies. “New literacies” is a highly contested space however; the construct means many different things to many different people. To some, new literacies are seen as new social practices (Street, 1995) that emerge with new technologies. Others see new literacies as new Discourses (Gee, 2003) or new semiotic contexts (Kress, 2003; Lemke, 1998; 2002) made possible by new technologies. Still others see literacy as differentiating into multiliteracies (New London Group, 2000) and others see something that juxtaposes several of these orientations (Lankshear & Knobel, 2003). When you combine all of these uses of “new literacies” with the use of the term, “New Literacies Studies” (Street, 2003), the construct becomes even more challenging to understand.

Our research team at the University of Connecticut has found important insights in each of these perspectives. Each provides important theoretical structure for the study of out-of-school contexts, especially with popular culture resources, and from more of a social and linguistic perspective. None, however, appear to provide the theoretical structure we require to study the use of informational resources, within school contexts, and from a point of view that includes both cognitive as well as social and linguistic perspectives. As a result, our collaborative group, the New Literacies Research Team at the University of Connecticut, has begun to draw from all of these perspectives as well as work in cognitive science, informational science, and informational literacy as we evolve a theoretical perspective that allows us to study the issues of classroom Internet integration that concern us, especially the nature of online reading comprehension and how best to support its development in classroom contexts.

Our first attempt (Leu, Kinzer, Coiro, & Cammack, 2004) at defining what we mean by the new literacies of the Internet and other ICTs explored ten principles to inform the study of new literacies in school classrooms: a) the Internet and other ICT are central technologies for literacy within a global community in an information age; b) The Internet and other ICT require new literacies to fully access their potential; c) new literacies are deictic; d) the relationship between literacy and technology is transactional; e) new literacies are multiple in nature; f) critical literacies are central to the new literacies; g) new forms of strategic knowledge are central to the new literacies; h) speed counts in important ways within the new literacies; i) learning often is socially constructed within new literacies; and j) teachers become more important, though their role changes, within new literacy classrooms.

In addition to these principles, we also defined the specific, elements of new literacies on which we focus our initial attention, based on what we do when we read online:

The new literacies of the Internet and other ICT include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other ICT to identify important questions, locate information, analyze the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others. (p. 1570)

We look at how each of these five functions change the nature of online reading comprehension: identifying questions, locating information, critically evaluating information, synthesizing information, and communicating online. While each function also takes place during offline reading comprehension, we find new strategies in each area that are uniquely defined during online reading comprehension because of the affordances of the Internet. We also suspect that since online reading comprehension is always initiated by a question or informational problem, this too reshapes the nature of online reading comprehension in important ways. Recent work by Taboada and Guthrie (2006) in traditional texts suggests that when reading begins with a question or problem it differs in important ways from reading that is not.

Each of us has contributed to elaborating this initial definition: Julie Coiro’s work (2003, 2006) is helping us to understand how these five functions serve to define online reading comprehension and its relationship to offline reading comprehension; Laurie Henry’s work (2005, 2006) helps us to understand that searching for information may be an important gate-keeping function during online reading; Doug Hartman’s work (1995, 2000, 2004) helps us to conceive of online reading comprehension as the rapid processing of intertextual elements as well as how to prepare content area educators for integrating new literacies into their classroom instruction; Jill Castek’s work (Castek & Bevins, 2006; Leu et al., 2005) helps us to understand the connections to children’s literature as well as the integration of new literacies into classroom instruction.

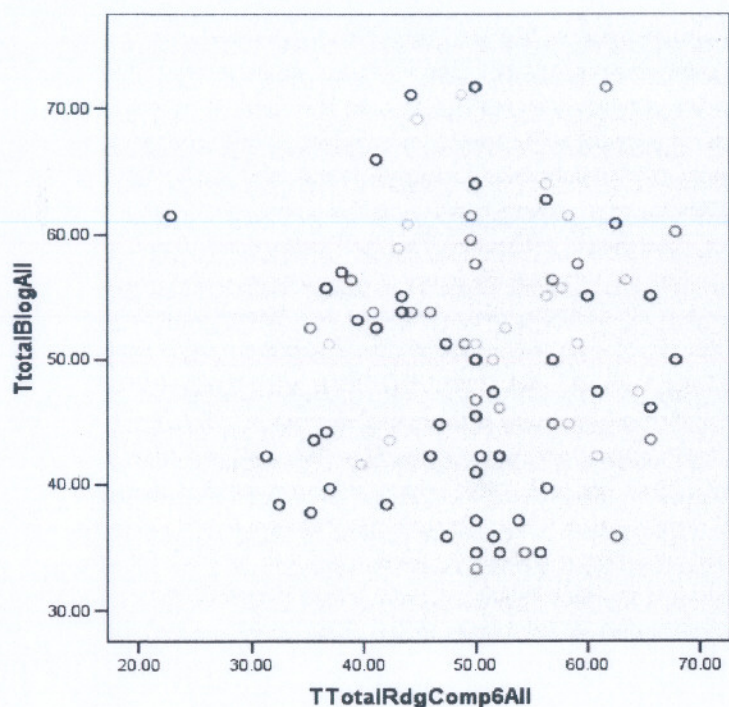
I should say something, too, about the manner in which we work. We believe the single investigator model that worked well during an earlier period of research is now outdated. Research questions have now become far too complex for any single person to explore; they require teams of people, each of whom brings their special expertise and theoretical perspective to the research enterprise. We believe that it is essential for our doctoral programs to reflect the collaborative team approach to research that is now required. We also believe in very high standards. Doctoral students who are advised by either Doug Hartman or myself must get an article accepted for publication during their first year. If they do, they become a part of the research team, and also become equal colleagues in the research enterprise. Once a doctoral student has published an article, we work “shoulder to shoulder” as equal partners in our research, each of us bringing our special background, interests, and expertise to the research we conduct. The power of this approach is clearly visible to each one of us on our team. It has produced a number of funded research grants and many articles.

One of our recent efforts involved developing together and conducting a research study funded by the North Central Educational Research Lab and Learning Point Associates—a study of integrating the new literacies of online reading comprehension into 7th grade science classrooms (The New Literacies Research Team, 2005). While we will present those results in a symposium tomorrow, I want to share with you one of the findings from this work.

It has long been established that assessments of literacy are inter-correlated (Farr & Roelke, 1971; E. L. Thorndike, 1917; R. L. Thorndike, 1973-74). Reading comprehension assessments, for example, always correlate with one another as well as with listening, writing, decoding, vocabulary, and many other language-based assessments, largely because all are, at heart, language and reasoning based processes.

In this study, we developed several measures of online reading comprehension—each with strong psychometric properties. Julie Coiro will present these instruments tomorrow in a session, so

**Figure 2.** Scatter plot of Online Reading Comprehension Assessment-Blog and total reading comprehension scores on the Connecticut Mastery Test as standardized T-scores. ( $r = 0.19$ ,  $p > .05$ )



I will not go into them now. I do, however, want to show you one result from this study—the scatter plot of correlations ( $n = 89$ ) between performance on the state reading comprehension assessment used for NCLB in Connecticut and performance on the Online Reading Comprehension Assessment–Blog (ORCA-Blog), one of the assessments of online reading comprehension that we have developed. In Figure 2, the horizontal axis represents converted t scores from the state reading comprehension assessment, The Connecticut Mastery Tests. The vertical axis represents converted t scores on the ORCA-Blog, our measure of online reading comprehension (Leu, et al., 2005).

Note that there is no correlation between online reading comprehension assessment and the state reading comprehension assessment. While this lack of correlation is only suggestive and we are exploring it in additional studies, it certainly is a pattern that raises important questions. New skills, strategies, and dispositions may be required during online reading that are different from those required to read books, magazines, and other traditional print media. You can also see on this scatter plot that some of our lower achieving readers on the state reading assessment were actually some of our higher achieving readers during online reading. This, too, raises important questions that will require additional study.

We are now working with another research team from Clemson University headed up by David Reinking that includes Amy Carter, Jackie Malloy, Caroline Mills, and Angie Rogers on an

IES reading comprehension grant. We are exploring the nature of these new literacies of online reading comprehension as well as the extent to which instruction in the new literacies of online reading comprehension increases academic achievement in content areas, engagement, online reading comprehension, and traditional reading comprehension achievement among low achieving 7th grade students in economically challenged districts in urban Connecticut and rural South Carolina.

#### TO FULLY UNDERSTAND THE ISSUE OF NEW LITERACIES, WE MUST RECOGNIZE THAT LITERACY HAS BECOME A DEICTIC CONSTRUCT

The term deixis is a word used by linguists and others (Fillmore, 1972; Murphy, 1986) for words like now, today, here, there, go, and come. These are words whose meanings change quickly, depending upon the time or space in which they are uttered. If I say “here” it means the location where I am at, now. If I walk four steps to the left, my “here” has suddenly become my “there” and my “there” has suddenly become my “here.” While to Gertrude Stein it was true that “A rose is a rose,” here is not here, is not here. Rather, its meaning may change rapidly.

The new literacies of the Internet and other ICTs are not just new today, they will be newer tomorrow, even newer next week, and continuously renewed as new technologies for literacy regularly appear, requiring even newer literacies to be able to use them effectively to read, acquire information, learn, and communicate. Of course, literacy has always changed as technologies for literacy have changed. What is historically distinctive is that by definition the Internet permits the immediate exchange of newer technologies of literacy. With a single click, a new technology for literacy (e.g., wikis, blogs, etc.) can be distributed to everyone who is online. This speeds up the already rapid rate with which new technologies and new literacies appear. In short, literacy has become a deictic construct on the Internet, its meaning changing rapidly.

We believe deixis is a defining quality of the new literacies of the Internet and other ICT. The rapid rate of change in technologies and literacies defines our age. For the first time in history, our capacity to adapt to changes in the nature of literacy limits the pace of change, not our ability to invent new technologies. Consider the implications of this for the classroom. It means that our students’ acquisition of new literacies will be driven by a teacher’s ability to keep up with these changes. Teachers who can, will exchange these new literacies with their students; teachers who cannot, will not. The consequences for assessment, teacher education, school leadership, professional development, and curriculum are profound. How, for example, can we construct assessment instruments that keep up with the continually changing nature of literacy, brought about by newer and newer forms of technologies.

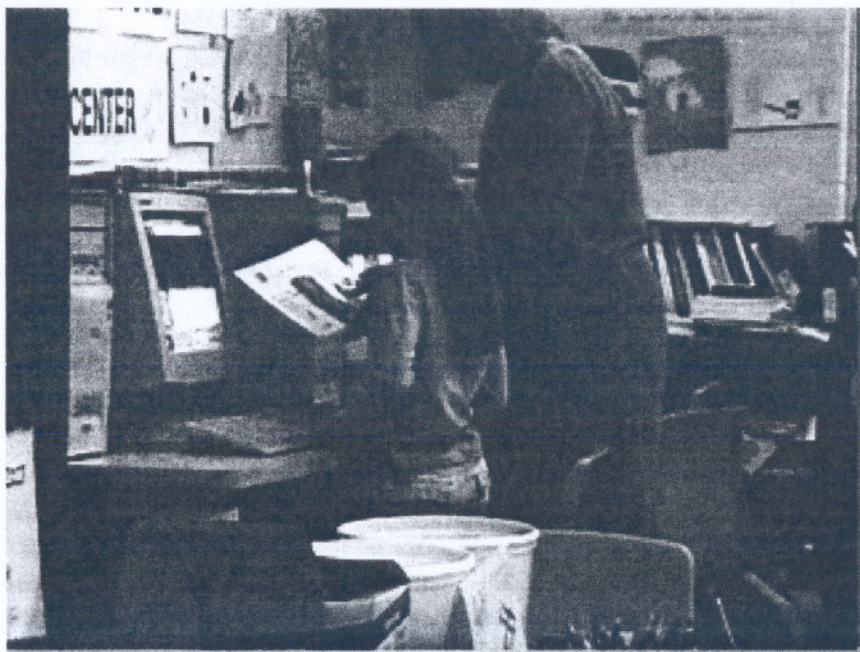
While keeping up with the pace of change can be daunting, one way to accomplish this is by communicating with others on the Internet who often know more than you. We learn much from these individuals.

One teacher, Susan Silverman has taught us an important lesson about a hidden potential of deixis for literacy classrooms. In far too many classrooms, teachers establish the policy that students can go on the Internet only after their regular work is complete. This of course, reifies a variation of the Matthew Effect (Stanovich, 1986) where the rich get richer and the poor get poorer. Susan



teaches us that you should always introduce a new literacy to your more challenged readers and writers first, enabling them to become the literate experts in the classroom who can then teach others. That is what Susan did in this classroom. The class had first listened to a reading of *The Mitten* (Brett, 1989). Then Susan quickly taught the young boy in this video, one of the weakest readers in the class, the new literacies required by a technology tool Susan was introducing into this classroom, Kid Pix. This made the young boy newly literate in Kid Pix, while others were not. Susan then set up a center activity where each student was to draw a picture of a mitten in Kid Pix, write their response to the book by Jan Brett inside the mitten, and then decorate the border with the digital stamp pad, creating an illustrated border in the style of the book's author. You can see how knowing the new literacies of Kid Pix changes the relationship between this young boy and the young girl, who is one of the best readers in the class. He is now the one who is privileged in his literacy and she is not.

**Figure 3.** The new literacies of Kid Pix, introduced first to a weaker reader in a second grade classroom. View this video at <http://ctell.uconn.edu/cases/newliteracies.htm>. You may require QuickTime, a free plug in available at <http://www.apple.com/quicktime/download/mac.html>.



Susan's lesson teaches all of us that when new technologies are introduced into a classroom we should teach the new literacies they require to our weaker readers and writers, helping them to become the literate experts who can then share their knowledge with others in the class. This has the potential to alter beliefs about literacy proficiency, changing their self-efficacy in powerful ways. The deictic nature of literacy permits this and we should always take advantage of it.

ONLY WHEN EACH OF US BRINGS OUR OWN EXPERTISE  
TO STUDYING LITERACY ON THE INTERNET CAN WE EXPECT  
STUDENTS TO FULLY REALIZE THEIR OWN POTENTIAL AS GLOBAL  
CITIZENS OF THE 21ST CENTURY

In this address, I have tried to share some of my thoughts and concerns about the new realities of new literacies emerging from new technologies. I have also tried to communicate the urgency with which we must bring our collective expertise to the study of how best to integrate these new literacies of online reading comprehension into K-12 classrooms. Many of our students are now reading with technologies far more powerful than books and writing with technologies far more powerful than paper and pencil. As a community of literacy researchers, we must all turn our attention to these new realities, these new literacies, and these new technologies.

It might seem that we are limited in our work without a common theoretical framework, since so many different definitions of new literacies exist (Coiro, Knobel, Lankshear, & Leu, in press). Perhaps, though, the multiplicity of theoretical frameworks in this area is, in fact, actually an advantage that should be seized upon. As Labbo and Reinking (1999) have suggested, within a complex research area it is important to be able to bring multiple theoretical perspectives to one's work. This approach suggests that including multiple theoretical perspectives is an essential component for research in new literacies. Every study in the area would benefit by framing research questions from more than a single theoretical perspective; the complexity of issues can only be systematically studied when theoretical structures are as rich and complex as the questions that any study seeks to address.

Now, let me challenge you as we near the end of our journey together this afternoon. If the prospect of richer, more complex worlds is an exciting one to you, and if the idea of having many more questions than answers is an interesting one, I invite you to bring your own work to the study of literacy on the Internet. As a research community, we need each one of you to bring your special area of expertise to this issue.

If you do work in emergent literacy we need your special insights to discover how young children should begin their literacy journeys on the Internet in developmentally appropriate ways.

If you study reading comprehension we need you to help us understand how comprehension processes are similar or different on the Internet. To the extent they are different, we need to know how best to support their development to support learning during online reading.

Scholars in the areas of composition and communication also have much to contribute. You can bring your powerful lenses to bear on issues of online communication. Clear, rapid, and effective communication that takes advantage of the Internet will be central to our students' success. We need to know how to support students in achieving this.

Insights from multicultural education and multilingualism are going to be especially critical to our effective use of the Internet. The Internet permits us to construct new definitions of multicultural as well as multilingual education, raising new questions about diversity in the classroom. If this work is done carefully, you will allow us to construct a truly global village that values the many benefits that diversity provides, fulfilling this important and timely verse from the Qur'an, "We made you into nations and tribes so that you might come to know one another." (Qur'an, Sura 49:13)

A central challenge for each of us is how to use these new technologies to support exceptional students. It is quite possible that the gap between proficient readers and less proficient readers will increase within the world of rich, complexly structured information networks as the effects of differences in reading rate and accuracy become magnified. Annemarie Palincsar, Bridget Dalton, and organizations such as the Center for Applied Special Technologies (<http://www.cast.org>) are providing important direction for us all, but we require many more scholars in this area to focus our attention on the issues that are involved.

Those scholars who focus on assessment have, perhaps, one of the greatest challenges to solve. How do we develop assessment instruments to measure the new literacies of the Internet in accurate and valid ways, especially when the technologies change so rapidly? Some preliminary work is finally beginning to take place in this area. In 2007, the National Center for Educational Assessment will conduct the first truly national assessment of adult literacy. We have been working with NCES and ETS to help define this assessment. Approximately 30% of this measure will assess new literacies, including online reading comprehension and email use. In addition a recent IES reading comprehension research grant to Kim Lawless and her colleagues at the University of Illinois, Chicago will also provide us with critically important new direction in this area.

Our colleagues who conduct research on teacher education also have an enormous agenda ahead. They need to apply their finest heuristics, helping us better understand how to prepare new and experienced teachers to support children in the new literacies of the Internet in the classroom.

Scholars exploring important agendas in adolescent literacy have already provided pioneering leadership. They have even more to contribute, however, hopefully as they increase their focus on classroom learning contexts. We are all counting on their continued leadership.

We also need to invite scholars in the areas of adult literacy to the research table. We cannot afford to leave adults behind who have not had the advantage of being prepared for the new literacies required of an information economy.

Family literacy scholars are essential, too, to the research that must be done. These networked information resources provide special opportunities to connect schools with families. How best to do so is another important question we need to address.

Additionally, scholars in the areas of children's and adolescent literature have much to contribute. New response opportunities become possible on the Internet, allowing us richer interpretations and appreciation for our finest forms of language use, especially when we can share these with others in different nations and different cultural contexts.

And finally, our historical researchers also have much to contribute. They can help us to better understand the changes taking place today in light of the changes that have taken place in the past to relationships between literacy and technology.

## TWO CONCLUDING THOUGHTS

As I think back to the lessons that NRC has taught me about asking important questions, I will leave you with two thoughts. First, each of us in our research community has important questions that need to be asked if we hope to understand the rapidly shifting nature of literacy in a globally networked age of information. The work ahead is immense. As a research community, each of

us must bring our special expertise to the study of literacy on the Internet. The task is too large, involves literacy in such profound ways, and must be accomplished so quickly that it is not possible to vest the responsibility for this work solely in the hands of those who have traditionally explored issues of literacy and technology.

The door is open. I hope that you might walk through it, bringing your own expertise to this journey while keeping a final, and most important, thought in mind: The questions you choose to ask will determine the literacy futures that our students achieve.

## AUTHOR'S NOTE

The original talk, the initial source of this paper, may be viewed online, along with all the other plenary addresses from the 2005 National Reading Conference at <http://www.newliteracies.uconn.edu/nrc/index.html>.

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