Preparing Students for the 21st Century

*How can teachers incorporate new literacies
into elementary classrooms?*

"Did we hear from Ireland?" Camika wanted to know as soon as she entered Cheryl Johnson's second-grade classroom. "Did they like *Grandfather's Journey?*"

Five classrooms from around the world had joined Cheryl Johnson's class in an Internet Project (Leu, 2001; Leu, Leu, and Coiro, 2004), exchanging morning messages by e-mail. Cheryl had posted a request for partner classrooms at the Project Registry location of Oz Projects (http://www.ozprojects.edna.edu. au/sibling/home), a site where teachers seek other teachers for collaborative Internet projects.

Each day, a second-grade classroom from Australia, Canada, Ireland, Japan, and South Africa sent all of the others an e-mail message describing important events in their classroom. Each class read these messages and composed a new message for the next day. Cheryl used this activity to integrate the new literacies of the Internet into her reading program. She knew that new technologies such as the Internet require their own special reading and writing skills. Although these new literacies were not yet included in her state reading assessment, she realized that they were essential to her students' future and would eventually be included in all reading assessments.

As Camika entered the room, the classroom e-mail helper for that week, Daryl, was already on the hunt for e-mail messages from their partner classrooms. He was sitting at the classroom computer using the class e-mail account. Daryl had previously shown little interest in school and sometimes arrived late. In this new role, however, he started coming to school early so he could work on the computer before any other students arrived. Daryl's job was to copy and paste the daily messages from their partner classrooms into a single document and then print out copies for everyone to read. He liked to have this done for the class before they all arrived at school. This simple daily activity prepared Cheryl's students for the new literacies that would be an important part of their lives.

What Are These New Literacies?

Each new technology for reading, writing, and communicating requires new literacies to take full advantage of its potential. This has been true ever since the first formal writing system emerged with cuneiform tablets from Mesopotamia

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more than 4,000 years ago. It has continued through the development of book technologies, and it is especially true in the age of the Internet.

The Internet is this generation's defining technology for literacy and learning. In 2004, 87 percent of all students in the United States between the ages of 12 and 17 used the Internet (Raine and Hitlin, 2005). Moreover, nearly 11 million students in this age group reported going online on a daily basis (Lenhart, Madden, and Hitlin, 2005). Interestingly, the Internet is prompting many students to watch less television. Nearly 33 percent of children reported in 2002 that they viewed less television after they had begun using the Internet; this is up nearly 50 percent from just one year earlier (Lebo, 2003).

> *"Locating information on the Internet requires very different reading skills from locating information in a book."*

The Internet has entered and profoundly changed the workplace. Professional reading and writing demands are fundamentally changing as we enter a world of digital globalization, information, and communication (Friedman, 2005). In just one year (August 2000 to September 2001), use of the Internet at work among all employed adults 25 years of age and older increased by nearly 60 percent, from 26.1 percent of the workforce to 41.7 percent (U.S. Department of Commerce, 2002). This early trend suggests that nearly everyone in the workplace will require the skills to read, write, and communicate effectively with Internet technologies. A recent Web@Work survey (Websense, 2005) indicates that 93 percent of workers in the United States who are over 18 years of age and work at companies with 100 or more employees use the Internet in their jobs.

As the defining technology for reading, writing, and communicating, the Internet requires new literacy skills to take full advantage of its potential for information and learning (Coiro, 2003; Leu, Kinzer, Coiro, and Cammack, 2004). Locating information on the Internet with a search engine, for example, requires very different reading skills from locating information in a book, using either a table of contents or an index (Henry, forthcoming). Reading on the Internet also requires more forward inferencing, as readers must predict the information they will find at a link on a page, piecing together the texts that they read (Coiro, 2005). Moreover, evaluative skills become essential to determine the accuracy of information that we encounter (Amernic, 1998; Amsbary and Powell, 2003; Bos, 2000; Wills, 2002). New skills in writing are also important (Trammall and Ferdig, 2004), from attaching a document to an e-mail message to using Instant Messaging conventions to composing a blog. New technologies require new literacies.

This changing nature of reading and writing has prompted the International Reading Association (International Reading Association, 2001) to call for the integration of these new skills into the reading curriculum. Which new skills should be included? The answer to this question is continually refined as new technologies appear (See Leu, Coiro, Knobel, and Lankshear, forthcoming). We have, however, developed a broad understanding of how to organize these skills as we integrate new research from cognitive science (Azavedo and Cromley,

2004), informational science (Bilal, 2000), and media studies (Hagood, Leander, Mackey, and Nixon, 2003). Leu, Kinzer, Coiro, and Cammack (2004) organize the major new reading and writing skills required on the Internet according to the following criteria:

"The new literacies of the Internet and other ICTs (Information and Communication Technologies) 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 ICTs to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others."

This statement classifies the emerging literacies into the following five major skill sets that we use as we read and communicate information on the Internet:

1. Identify important questions. When we read on the Internet, we almost always begin with a question or another informational need. It becomes increasingly important to help students know how to ask important questions and to use the Internet to help generate those questions.

2. Locate information. We require new skills to locate information quickly on the Internet (Henry, forthcoming). New reading comprehension skills are required to effectively use each separate search engine we encounter. They are also required to read and make inferences from search engine results, so that we select the best links for our needs. Finally, Web pages are uniquely organized. New reading comprehension skills are required to navigate Web sites to locate the information we require.

3. Critically evaluate information. Anyone may publish anything on the Internet. As a result, we must attentively evaluate information for accuracy. As students read, we want them to be able to determine the following:

- Who created this information?
- Why did they publish it?
- When was it published?
- How was this information shaped to suit the author's purposes?
- How can we check this information with other sources?

"Readers on the Internet create their own text."

4. Synthesize information. As we read a book, we construct the text in our minds. Readers on the Internet construct texts in two ways (Coiro, 2005). First, they construct the text internally, as one does while reading a book. In addition, however, readers construct the external text that they read through the links that they take and the choices that they make. Readers on the Internet create their own text. No two readers, starting at the same point with the same question or purpose, will create the same text. Each creates a unique external text. This external construction requires new skills so that we make wise choices about the links to follow.

5. Communicate. Reading and writing become inseparable on the Internet; we write as we read, and we read as we write. We compose texts through the links that we select during reading, of course. Moreover, we read and compose information with new communication technologies such as blogs, e-mail, and Instant Messages or Text Messages. Each requires new communication skills.

These five skill areas capture the basic changes to reading comprehension that take place online. It is important to note, however, that decoding, vocabulary, and text comprehension continue to be important on the Internet. In fact, little can be accomplished on the Internet without them. However, these new types of reading comprehension skills are equally necessary (Coiro and Dobler, under review). Online reading comprehension changes in important ways as new skills in each of these five areas become important to successful online reading comprehension (Leu, Castek, Hartman, Coiro, Henry, Kulikovich, and Lyver, 2005).

How Can We Teach the New Literacies of Online Reading Comprehension?

There are at least four instructional models that may be used to develop new literacies: Internet Workshop, Internet Project, WebQuest, and Internet Inquiry. Each may be used in your reading program as well across all of the content areas. (For a richer discussion of these instructional models, view the video presentations located at http://ctell.uconn.edu/canter/canter_video.cfm. To see how these models may be integrated into a literature program, see Leu, Castek, Henry, Coiro, and McMullan, 2004).

Internet Workshop

Perhaps the easiest instructional model for integrating the Internet into your classroom reading program is Internet Workshop (Leu, 2002; Leu, Leu and Coiro, 2004). Internet Workshop has many variations. Generally, though, it consists of these steps:

1. Locate a Web site or several Internet sites with content related to a classroom unit of instruction and electronically bookmark the location(s).

2. Develop an activity requiring students to use the site(s).

3. Assign this activity to be completed during the week.

4. Have students share their work, questions, new knowledge, and new reading comprehension skills at the end of the week during a workshop session.

Internet Workshop may be used, for example, to conduct an author study, helping your students better understand an author your class is reading. If, for example, you are reading works by Jan Brett, simply set a bookmark for **Jan Brett's Home Page** (http://www.janbrett.com/) so your students may quickly access this location. Then develop an activity for students to complete using the information at this site. You could, for instance, invite students to explore the site and bring to the workshop session three interesting facts they learned about the author, recording the information they find in a hard-copy "Internet journal." Next, assign this activity to be completed during the week using your classroom computer or a school computer lab during assigned or sign-up times. At the end of the week, conduct a short workshop session in which students

share and exchange the new information they learned. Be certain to have students share also the reading strategies they used while they were gathering information. Internet Workshop can be an essential first step in the integration of new literacies into your reading program.

Alternatively, you could bookmark a search engine and give students an informational problem that is related to your current curricular unit. (For example, What kinds of food did Benjamin Franklin eat for dinner?) Ask students to bring the answers to a workshop session. They can also share the search strategies they used and the critical evaluation strategies they used to verify the information they discovered. Students will often share new and useful strategies that you may not have considered.

"Students will often share useful strategies that you may not have considered."

Internet Project

After bringing Internet Workshops into your classroom, you may wish to integrate another instructional model—the Internet Project. In an Internet Project, your class engages in a collaborative, project-based learning activity with other classrooms around the world (Leu, 2001; Leu, Leu, and Coiro, 2004). There are at least two different types of Internet Projects: Web site projects and spontaneous projects.

Web Site Projects Web site projects are long-term projects coordinated by an individual or group at a Web site. They are a useful starting point for teachers who wish to follow a project-based model of Internet use, since they include clear directions for participation and a complete set of instructional resources. One example is the Flat Stanley Project (http://flatstanley.enoreo.on.ca/) based on the book of the same name by Jeff Brown. After reading this book, students send their own Flat Stanleys on trips to other classrooms. For more information, visit **How Does It Work?** (http://flatstanley.enoreo.on.ca/how.html).

Another example is a travel-buddy project, in which your class corresponds with other classrooms through hosting a stuffed animal and sharing e-mail descriptions of the books your buddy is "reading," foods it is "eating," and other activities common to your location. These e-mail conversations often lead to new online learning projects between classrooms. Visit the **Traveling Buddies Chatboard** (http://teachers.net/projects/traveling_buddies/) to learn more about how this works and to locate other teachers who are looking for classes to join them in a travel-buddy project.

To discover additional online projects, simply google *Internet classroom project* and explore the many fine sites that come up with this search. You will find many additional learning opportunities.

Spontaneous Projects Spontaneous projects are also developed by teachers for specific curriculum needs. Teachers who create a spontaneous project post a description on the Internet to attract collaborating classrooms. After other teachers agree to participate via e-mail, students in each classroom complete the project together and share their work. These collaborative projects provide special opportunities for your students to communicate with others in

classrooms around the world about issues of common interest. You can join spontaneous projects at several locations, including the following:

• **Oz Internet Projects Registry** (http://www.ozprojects.edna.edu.au/sibling/home)

• **Global SchoolNet's Internet Projects Registry** (http://www.globalschoolhouse.org/GSH/pr/index.cfm)

• **Kidproj** (http://www.kidlink.org/KIDPROJ/)

To learn more about Internet Projects and to see additional examples, you may wish to read an online article about this instructional approach that appeared in *The Reading Teacher*. It is available at http://readingonline.org/electronic/elec_index.asp?HREF=/electronic/RT/3-01_Column/index.html.

WebQuest

Another easy instructional model is a WebQuest. WebQuests are complete teaching/learning units on the Internet for students. Students simply follow the directions and complete their learning experiences at a WebQuest site. WebQuest pages usually contain the following sections:

• Introduction

• Task Definition

• Description of the Process

• Information Resources

• Evaluation

• Concluding Activity

WebQuests may be developed by anyone, but most of them are developed by teachers. Because they appear on Web pages, they are also available to other teachers. You can discover more about WebQuests and see several examples by visiting **The WebQuest Portal** (http://webquest.org/).

Perhaps the best strategy to locate a WebQuest for your particular purpose is to perform a search for your desired topic with the word WebQuest. Thus, to find a WebQuest for students who have completed reading *The Bridge to Terabithia* by Katherine Paterson, search for Bridge to Terabithia WebQuest. Be careful with WebQuests, though. Often, you will need to search through many of them to find a well-designed, up-to-date WebQuest. The questions below provide useful criteria for evaluating a WebQuest:

1. Does this WebQuest meet important curriculum goals and learning objectives?

2. Will it be a worthwhile use of my students' time?

3. Does the WebQuest require students to think critically about information and to evaluate the information they encounter?

4. Does it accommodate diverse learning needs and interests?

5. Will students have an opportunity to share the results of their WebQuest with the rest of the class for discussion and additional learning?

6. Do students know, in advance, how their work on the WebQuest will be evaluated?

7. Are all of the links on the WebQuest active and appropriate for students?

Internet Inquiry

For students and classrooms with some experience using the Internet, Internet Inquiry is another useful framework (Leu, Leu, and Coiro, 2004). In an Internet Inquiry, individuals or groups identify an important question and gather information as they seek answers to their question. This turns over much of the responsibility for learning to students, who pursue the answers to questions that are important to them. Internet Inquiry is often used to supplement traditional content-area instruction.

Internet Inquiry consists of these five phases:

Step One: Question During this phase, students identify an important question they wish to explore. You can engage in class brainstorming sessions or bookmark a few Internet sites on the topic to help students choose a particular issue that interests them and to get them started. Alternatively, you may wish to teach new search-engine skills at this phase to help students explore more broadly before they settle on a topic.

Step Two: Search Once students have decided on a subject to explore, the search phase begins more intensively. Students will need to search on the Internet for useful information related to their topic. You can teach them new search-engine skills in this phase. You might also introduce a few different types of search engines and explain what each does best. Remind students to use the more traditional resources found in their classroom or school library, as well, during their search.

Step Three: Analyze During the third phase, students should evaluate the information they have located and respond to the question they chose. This is where the new literacies of critical evaluation become important.

• How can students discover who created a Web site?

• What do they know about this person or group?

• What does this tell them about how the author presents the information?

• How can students check the accuracy of the information they found?

Your class should explore all of these questions at this phase.

Step Four: Compose The fourth phase of Internet Inquiry requires students to compose a presentation of their work. There are many ways to do this: a traditional written report, a poster session, a multimedia presentation, or an oral report.

Step Five: Share During the final phase, students have an opportunity to share their work with others and respond to questions about their work. Some teachers set aside a regular time each week for sharing inquiry projects as they are completed. Sometimes this takes place during Internet Workshop or during a special science or social studies fair where students have an opportunity to share their work with other classes at school.

Internet Inquiry can be an exciting part of your curriculum because it offers students important opportunities to read, analyze, and write within content areas such as math, science, and social studies. It allows you to integrate these

Projects such as Internet Inquiry support students as they learn to use the Internet independently.

subject areas with language arts in powerful ways. Finally, it provides self-directed learning experiences, which engage students in what they learn.

How Are Exceptional Teachers Integrating New Literacies into Their Classrooms?

Just like students, teachers need to acquire new literacies. As students learn to use information technologies, teachers must develop new understandings that will help them organize the classroom and teach in different ways. Fortunately, the Internet makes it easy for us to learn from exceptional colleagues who are pioneering new ideas in their classrooms every day.

Alaska Consider, for example, Jack Fontanella at Harborview School in Juneau, Alaska. Who says the Internet is not for Kindergarten classrooms? Exploring Jack's classroom home page (http://www.jsd.k12.ak.us/hbv/classrooms/Fontanella/fontanejhbvHome.html) will put to rest the idea that Kindergarten children are too young to acquire developmentally appropriate new literacies.

Spend a few moments exploring the alphabet books created by Jack's students using KidPix software. Jack invited his students to create these illustrations, as well as sentences for each letter of the alphabet. It is a wonderful idea for any Kindergarten classroom. His site also communicates information to parents about the important learning experiences taking place in his classroom. Jack provides links to resources to help parents understand the developmental growth their children will undergo during this period. The page also features links to many other Kindergarten classrooms around the world, helping Kindergarten teachers connect with colleagues and share instructional ideas. Exploring Jack's classroom home page will allow you to understand how many teachers, even at the Kindergarten level, are helping students develop new literacies on the Internet.

New Jersey Marci McGowan, a second-grade teacher in Spring Lake, New Jersey, is another pioneering educator. Marci is an expert in the use of Internet Projects. She has a wonderful explanation of this approach at http://www.mrsmcgowan.com/projects/index.html, including how to align the projects with your state standards. You can also explore all of the projects in which Marci's classes have participated. A number of these projects provide special literary response opportunities for children, including projects on Pippi Longstocking, Jan Brett, fairy tales, and many more. Visiting this site will provide you with many new ideas for integrating new literacies into your classroom.

Wisconsin Mary Kreul, a fourth-grade teacher in Wisconsin, is another expert in Internet Projects. Visit her classroom site (http://www.mskreul.com) and link to her projects site. You will discover a host of exciting experiences with other classrooms that she has used to expand response opportunities. Mary's classes have participated in Internet Projects about Tales of a Fourth Grade Nothing and Kidspired Frosty Tales, among others. In addition, Mary has a classroom blog. Explore her classroom's blog to see how this new technology, and these new literacies, may be used to record classroom activities and events.

Reviewing various classroom Web pages can guide teachers to use the Internet in their own classrooms.

Elsewhere Each of these teachers has incorporated information technologies into his or her classroom in powerful ways. They help us understand how to integrate new literacies into our own classrooms.

These are not the only teachers who can teach us, though. You can find many other outstanding pioneers who are exploring new literacies in their classrooms by doing a Google search using this syntax:

• Mr./Ms./Mrs./Miss (select one at a time)

• first/second/third/fourth/fifth/sixth grade (select the grade level you seek)

• classroom home page

• award

We use these search terms since most classroom home pages have something like this at the top of the page: Ms. Jonnasen's Third-Grade Classroom Home Page. You may include the search term *award* if you seek classrooms that have won awards for their work with information technologies.

Why New Literacies Are Important: A Vision of a More Understanding as Well as a More Literate World

New literacies, of course, create new opportunities for students as they begin to learn and grow using the Internet. Many new insights and understandings await any student who knows how to use new technologies for information and communication. Using the models outlined in this article can start students on a path for learning that can last a lifetime.

Just as important as these literacy and learning outcomes, however, is the potential for creating a more understanding and just world. As you and your students begin to exchange ideas with classrooms around the world (as Cheryl Johnson's class did), you will begin to realize the potential for opening the windows of your classroom to the entire global community. Meaningful interactions with other students from diverse communities will give your students insights into the world around them. The Internet enables us to learn from our neighbors.

"The Internet enables us to learn from our neighbors."

Collaborating on an Internet Project with other classrooms will help your students understand different cultures and traditions, allowing them to participate in new explorations of what multicultural education can and should be. These collaborative learning projects will help your students appreciate the benefits of diversity, as they encounter different ways of solving problems or thinking about literature. And as any international traveler knows, visiting another culture always helps you understand your own a bit better. These global, collaborative connections we forge in our classrooms with new literacies and Internet technologies make possible a more just and a more understanding world. Perhaps this is the best gift we can pass on to our students.

"Did we hear from Ireland? Did they like *Grandfather's Journey*?"

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