Integrating technology with the teaching of an early literacy course

The early literacy course described used many kinds of technology to improve teaching and learning.

While studying to become a reading specialist, Debbi Rooyakkers (third author) selected as one of her methods requirements a course called "Literacy Development in the Early Years." Debbi's reflections, which appear in the sidebar on pp. 228–229, illustrate that the technological revolution has doubtless made its mark. It has dramatically changed learning and communication in the process. On a daily basis we check our e-mail, go to automatic teller machines for cash, and coordinate our schedules on handheld computers. With technology an integral part of everyday life, it is our responsibility as educators to teach students how to use relevant equipment.

This article describes a project designed to enhance the technological ability of university students enrolled in an early literacy course. By modeling the use of technology as a tool for literacy instruction for them, we hoped that these teachers and future teachers would become more familiar with technology and use it when teaching their early childhood students to read (Morrow, 2001).

Technology and literacy development

A responsibility of education is to prepare students for the future. We have to teach our students to use technology if we want them to succeed in today's world. Valmont and Wepner (2000) stated,

Functional literacy means that people are able to process print in their environment, whether it be newspapers, train schedules, or official documents. Now included in this array of materials for which people must have functional literacy is information technology. Everywhere we go there is a reference to an online address. Radio and television advertisements send their listeners and viewers to web sites to get additional information about the many items advertised. Retail stores and local services boast about their 24-hour accessibility through their specialized web sites. (p. 5)

In order to prepare our children, we must recognize the impact of technology in today's workplace and train them accordingly. Technology can help to support and enhance the development of reading, writing, and the language arts, which are the foundation for success in school and in life (Reinking, 1999).

We have entered a time when technology is developing rapidly, which has an important effect on literacy development (Leu, 1997; Rickelman & Caplan, 2000). The changing constructions of literacy within new technologies will require us to train teachers to prepare children for these changes (Leu & Kinzer, 2000). The literacy needs and demands of a changing society must be addressed in school when children are very young. The World Wide Web has created the necessity for new literacy abilities such as search and navigation strategies and synthesis and critical thinking (Reinking, 1999).

Technology can be used as an instructional tool to support literacy development. Computer technology is effective when it is used to supplement, not to supplant, the teacher (Balajthy, 1989; Labbo, 1996).
Using technology in literacy instruction—benefits

Research suggests that there are benefits to using technology as a tool in literacy instruction. Technology appears to motivate children and to increase the time they are willing to spend practicing important academic skills. This is especially helpful to teachers when trying to work with children who have difficulty acquiring reading skills and who may become easily frustrated and disinterested. According to Stanovich (1986), extended involvement in reading is essential for developing reading ability. Daiute (1983) found that students exhibited a higher level of motivational engagement when using technological tools. Studies that compared word processing revision versus handwritten revision commonly found that children were more highly motivated to revise when using the computer, which led to more time spent on the revision process (Kamil, Intrator, & Kim, 2000).

Another benefit of technology use is that computers can provide individual reinforcement of skills. Providing instructional activities designed for individual abilities has always been a challenge for teachers. However, many software programs have adjustable levels of difficulty, and children can be trained to use this software on their own. Children can use it in learning centers when the teacher is working with other children in small groups. The computer provides opportunities for cooperative learning as children work in pairs or small groups. Cooperative learning promotes academic achievement, social interaction, and positive attitudes in the classroom (Baker, 2000).

The computer allows teachers and children to communicate and share ideas with others around the world. At the same time, it offers the opportunity to discuss how to carefully read the information acquired on the Internet and assess its reliability. Computers and Internet use provide teachers and children with access to information all over the globe. Children can direct their own learning as the computer brings them into contact with information not available in print. The computer may provide the most current information and is always being updated. Nevertheless, children must also learn how to evaluate the accuracy of that information. Both verifying and referencing information are important literacy skills whether the information is from the Web or from a book (Baker, 2000).

Using technology in the classroom—challenges

Although there are many benefits, a major challenge with technology is the cost. Many school districts are now equipped with computers, and hardware costs continue to fall; however, the ratio of computers to students is still just 1 to 5 (Symonds, 2000). In addition, keeping up with equipment upgrades, current software, monthly telephone/cable/Internet provider connection charges, printer ink cartridges, paper supply, diskettes for students, and so on is a constant challenge (Leu & Kinzer, 2000).

Training children to use technology is challenging due to time constraints in the school day. The level of technical expertise among the children varies. For example, some students will need instruction in how to use software programs, access the Internet, do searches, and use word processing. Others will already have these skills. Many districts provide a computer class as a special subject, like art or music, where students learn these skills and the burden is not on the classroom teacher. In addition, there are many good software programs that students could use to practice these skills. If teachers incorporate technology into their instruction, this model will heighten their children’s awareness about the use of technology.

Technology in preservice and inservice training

Preservice and inservice professional development of teachers is probably the most overlooked yet essential component for integrating technology use with literacy instruction. Teacher training is essential to provide children with quality learning experiences involving technology. As in all educational endeavors, a committed, knowledgeable teacher is the most instrumental factor in effective instruction (Leu & Kinzer, 2000). Because new technologies continuously appear, staff development for practicing teachers must be continuous (Wepner, Valmont, & Thurlow, 2000).

Separate courses in the use of technology are available for inservice and preservice teachers. Although they may be related to educational
activities, they are not content specific. Another way of dealing with teacher training and technology is to integrate it with content-area teacher education courses.

Technology in the early literacy course

In the early literacy course discussed here, the instructor (Lesley Morrow, first author) enhanced her instruction with technology use. In this way she modeled how technology could be used in teaching. As the university students learned about instructional approaches to early literacy, they were also learning about the use of technology in teaching. In addition there were explicit activities that required technology use in their assignments.

The purpose of the project. The Graduate School of Education at Rutgers University (New Brunswick, New Jersey) received a grant from the U.S. Department of Education to incorporate technology into different content areas within our education programs. (Steven Barnhart, the second author, was the principal investigator on the grant.) We were to determine the effect that embedding technology in our instruction had on our own students' knowledge of technology and, further, how this affected their use of technology in their own classrooms. The university students in the class were a combination of individuals seeking their initial teacher certification (two thirds) and practicing teachers (one third). Reported here are the results of a course entitled Literacy Development in the Early Years.

Embedding technology in an early literacy course

Procedures. The early literacy course lasted for a 15-week semester and met for 2 hours and 40 minutes a week. The syllabus for the course required university students to use technology in their assignments, and they were given a list of suggestions for doing so. To enhance students' knowledge, the instructor modeled behavior by using the different technologies in every class session. To expose university students to and engage them in technology use, the following activities were required.

1. Chat on the class website at least twice—once to initiate discussion about text read or some class discussion and once to respond to others.
2. Participate in an interactive chat on the class website at least once during the semester.
3. Post some of your projects, your students' projects, or items of interest on the class website.
4. Read and prepare an abstract for an online article from a professional journal about literacy development and describe the experience of getting information this way, as opposed to a paper copy of a journal.
5. Use some type of technology that you haven't used before (i.e., do research on Internet, make a PowerPoint presentation, create a website for your class).
6. Use an educational website to locate practical teaching ideas.
7. Participate in an interactive television (ITV) demonstration.
8. Videotape your class presentation for your own critique of your work.
9. When at your field placement, use technology in three different lessons and in three different ways in your literacy instruction.
10. Preview and critique one piece of software that teaches a literacy skill.

How technology was used during the course

Use of the website. A website was set up for the course (see Figure 1). University students could log on and access it from home. With it, they could check the time and place of the course and view the syllabus. Students could look over the requirements for the course, see the grading system and textbooks required, contact the instructor, participate in online discussions, and post and receive messages from their instructor and classmates. The Web discussions could continue after the course ended because the website remained intact for a year. The website entries were used to discuss reading assignments and class lectures. University students could share thoughts and ideas about these with others and also discuss content that needed clarification. The instructor left a weekly message reminding students about assignments, providing additional explanations for difficult concepts, and adding information she forgot to discuss in class.

Another use of the website was to participate in an online chat. The instructor conducted two chats during the semester. University students logged on from home to participate. After the chat, they discussed their feelings about such
communication and whether it would be useful with young children. Most believed it would be, and their suggestions for using the Web included (a) organize chats with authors of children's literature, (b) organize electronic pen pals (e-pals) and chat with children anywhere in the world, and (c) post children's work on the Web for parents to look at.

The following conversation took place among the university students concerning an assignment. One person started the discussion by posting his thoughts, then others responded to the message. What is important about this chat is how students continue their class discussion on their own time. They are bouncing ideas off one another and entering into a reflective conversation about literacy instruction.

John—As far as the readings go this week, I never imagined how hard it was for young children to retell a story. I read the chapter before I did a retelling with the child I am evaluating and I assumed he would have no problem. I even picked a Franklin story to be sure of the simplicity, but sure enough as soon as I finished reading it he had no idea how to begin to retell the story. I used questions that the text suggested, but it was basically "I don't know," and he was so frustrated...to the point in which he said he didn't like the story even though he clearly enjoyed it while I was reading it. So then I used some more specific prompts and allowed him to use the pictures in the book, and he got started.

Mike—I had a similar problem, and using the pictures in the book as prompts worked for me too. I used the same story as you did and I got my child to retell by starting the story for him. I said "Once upon a time there was a turtle named Franklin," and then I stopped and he began to retell. He didn't do a great job but at least he said something. I did it again another day, and he was much better at it. They do need practice.

What struck me most when reading that chapter 7 in our text was the large number of strategies available to teachers when developing children's comprehension. I remember when I was in elementary school we would read a story and complete a worksheet with questions about the story. It was graded and handed back. Very little discussion took place. In the
lower grades I remember being read to, but such strategies as story retelling, KWL, and DLTA/DRTA were never used. The teacher sat at the front of the group and read the story, showing us the pictures as she went. Then she asked us if we liked the story, and maybe we'd draw a picture about it. It certainly is an exciting time to be entering the field of education. So many different modes of teaching and learning are arising as well. Children in this new millennium should be much better prepared as readers at an early age.

Cheryl—I thought that Mike was absolutely correct when saying that children are at a better advantage with their comprehension strategies than we were as kids. I don't remember teachers focusing on thinking skills in order to help us better comprehend the text. You just passed or failed and moved on. Today we teach young children strategies to use graphic organizers such as maps and webs to help them to comprehend.

Currently I am doing my teaching practicum in a third-grade classroom. The teacher that I am observing demonstrates perfect KWL and DRTA teaching methods. She used the KWL approach for *The Hundred Dresses* and the DRTA approach for the basal reading lessons. One day she asked the children to focus on their thinking strategy—whether it is predictions, previewing, or reader response. The children can identify the strategy they are using and will be able to use these strategies for a lifetime of reading.

Each university student was to post comments on the website twice during the semester, and the instructor logged on once a week for a total of 14 entries. In this class of 30 students, there were 142 entries on the Web during the semester. Therefore, on average, the university students logged on to the website four times during the semester when it was only required to do so twice.

**Interactive television.** The instructor also conducted interactive television demonstrations. ITV is often referred to as videoconferencing. As mentioned earlier, one distance group was always in attendance because it was taking the entire early literacy course. Two other groups participated in three other class sessions, which were selected based on topic. The three groups were made up of teachers and coordinators from three different school districts, and they participated in the course from each school system’s ITV room. All involved received course credit or staff development credit. Teachers do not like to travel after school for staff development, and ITV is one way to ensure attendance at such sessions.

ITV allowed the university students to listen to teachers from other parts of the state talk about their ideas and discuss similar problems. The instructor gave helpful hints about teaching successfully with ITV, based on her experience.

- All sites need a technician in case something goes wrong with the equipment.
- All sites need to have someone in charge such as the main instructor or a teaching assistant.
- Supplies needed for a class must be available at all sites.
- Plan the sessions so that students can interact with one another at their sites, students at other sites, and the instructor.
- Assign names to the groups so that you can address them and they know you are talking to them. The names can be their school districts.
- Students must be aware that whispers are picked up on the microphones from all sites and movements are seen as well.

One class session with ITV involved reviewing story structure for the development of comprehension. University students were to identify the different structural elements within a story such as setting, theme, plot episodes, and resolution. Before viewing a video of a story to identify structural elements, the instructor put a story map on the document camera that pictured the elements of story structure. She assigned a story element to each group to identify in the video. For example, the students in the classroom with the instructor, on TV screen 1, would identify the setting of the story and the characters. The group seen on TV screen 2 would identify the story theme, those on TV screen 3 would identify the...
plot episodes, and those on TV screen 4 would identify the resolution of the story.

After watching and listening to the story the instructor called on each of the different sites to fill in their section of the story map. Site 1 started the map by filling in the setting of the story and the story characters, site 2 stated the theme of the story, site 3 listed the plot episodes, and site 4 talked about the resolution of the story. The session was truly interactive with all sites participating and contributing.

From time to time there were technological problems—it was difficult to hear someone at another site, or the picture on the TV wasn’t quite clear. Nevertheless, the university students agreed that the ITV experience started them thinking about how to use this technology with the children in their current or future classrooms.

One second-grade teacher, who had never seen this technology in use before taking this course, explored how to use it with her children because her district had an ITV room. She decided to use the ITV to get together with another second-grade class in another state, because they were both studying rain forests. At the end of the unit, both teachers in their districts’ ITV rooms, 500 miles away from each other, had their children read stories they had written about the rain forest, share experiences about field trips taken related to the rain forest, and share recipes for snacks made from food that comes from the rain forest. Most important, these second-grade children, who had been pen pals during the school year, got to meet one another on TV.

Literacy software and PowerPoint demonstrations. During the course, the students demonstrated the use of various types of software to develop literacy. One demonstrated a program that provides children with a basic framework for writing a story. One feature, “Story Starters,” helps children generate ideas for their story, although they can write original stories as well. The software allows the children to start out with the title page. They type the title of the story, the author (or authors), and a copyright date. They are also able to choose from a selection of colorful thematic borders. Then the children go on to the next page and begin their stories. For the top of the page, the children choose a graphic or background and add objects such as people, cars, or animals. Then on the bottom half of the page they write their text. Spell-check is available to help the children edit their stories.

The university students were each responsible for a presentation. They were to model the teaching of a literacy skill using children’s literature and a game or manipulative material they had created. The typical material might be word building using letters on a magnetic board or making little words from big words on a felt board. Several students used PowerPoint presentations and created word-building activities on the computer. In this activity, the child moves

As can be seen on the television screen in the wall, in addition to the students on site in the ITV classroom there was one group of teachers at a different site who were always in attendance for the class sessions. Photo by Lesley Mandel Morrow.
Figure 2
Completed technology log

<table>
<thead>
<tr>
<th>Date</th>
<th>Technology (program) used</th>
<th>How technology was used</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/00</td>
<td>Microsoft Word</td>
<td>Write a paper</td>
</tr>
<tr>
<td>10/00</td>
<td>Web CT</td>
<td>Responded to articles</td>
</tr>
<tr>
<td>10/00</td>
<td>Scanner equipment/software</td>
<td>Copied pictures</td>
</tr>
<tr>
<td>10/00</td>
<td>Microsoft PowerPoint</td>
<td>Created presentation</td>
</tr>
<tr>
<td>10/00</td>
<td>Interactive TV</td>
<td>Participated in class</td>
</tr>
<tr>
<td>10/00</td>
<td>Web CT</td>
<td>Class chat</td>
</tr>
<tr>
<td>11/00</td>
<td><a href="http://www.alfy.com">http://www.alfy.com</a></td>
<td>Built lesson plans</td>
</tr>
<tr>
<td>11/00</td>
<td>ERIC (<a href="http://www.libraries.Rutgers.edu">http://www.libraries.Rutgers.edu</a>)</td>
<td>Searched for articles</td>
</tr>
<tr>
<td>11/00</td>
<td>Proquest (<a href="http://www.libraries.Rutgers.edu">http://www.libraries.Rutgers.edu</a>)</td>
<td>Searched for articles</td>
</tr>
<tr>
<td>11/00</td>
<td>E-mail (<a href="http://www.yahoo.com">http://www.yahoo.com</a>)</td>
<td>Communicated with teacher/classmates</td>
</tr>
<tr>
<td>11/00</td>
<td><a href="http://teachervision.com">http://teachervision.com</a></td>
<td>Searched for ideas for lesson plans</td>
</tr>
<tr>
<td>12/00</td>
<td><a href="http://www.lessonplanet.com">http://www.lessonplanet.com</a></td>
<td>Searched for ideas for lesson plans</td>
</tr>
<tr>
<td>12/00</td>
<td><a href="http://www.educationplanet.com">http://www.educationplanet.com</a></td>
<td>Read articles on guided reading</td>
</tr>
<tr>
<td>12/00</td>
<td>Web CT</td>
<td>Class chat</td>
</tr>
<tr>
<td>12/00</td>
<td>Jumpstart 2nd Grade</td>
<td>Games/educational lessons w/students</td>
</tr>
<tr>
<td>12/00</td>
<td>Where in the World is Carmen Sandiego?</td>
<td>Game with students</td>
</tr>
<tr>
<td>12/00</td>
<td><a href="http://www.readingonline.org">http://www.readingonline.org</a></td>
<td>Searched for articles</td>
</tr>
<tr>
<td>12/00</td>
<td>Bailey's Bookhouse (software)</td>
<td>Game with students</td>
</tr>
<tr>
<td>12/00</td>
<td>Jumpstart 3rd Grade</td>
<td>Played educational games</td>
</tr>
</tbody>
</table>

An initial consonant in front of phonograms or word endings to create new words. As the semester continued, the sophistication of these materials increased. As one university student got up to present she said, "Don't laugh at my PowerPoint presentation. I was determined to do one and I've never done one before. I didn't care how it came out, I just wanted to try." Her presentation turned out to be most effective.

An evaluation of the project
Several measures were used to collect data from the university students concerning the project's success. These measures included the following:
- Students completed a survey designed to determine their knowledge and use of technology at the beginning and end of the semester. The purpose was to determine if technology knowledge was enhanced after completing the course.
- Students filled out logs throughout the semester to record the technology they used for the course. The log required student to write the date, the type of technology, and how it was used.
- A random selection of 10 university students in the class were interviewed at the end of the semester. They were asked to answer questions about how the course influenced the integration of technology into their present literacy instruction or what they would do in the future.

Analysis of the data collected
Pre- and postsemester survey results. The results of the surveys of the 30 students from the university site, given at the beginning of the semester, show the following:
- 80% rated themselves as capable at word processing
- 57% rated themselves as familiar with and capable with Internet searches for educational information
- 30% rated themselves as capable with chats and online Web discussions
- 87% rated themselves as not familiar with ITV or distance education
60% of the students felt that they were unfamiliar with software programs designed to develop children's literacy skills.  
75% never attempted to develop meaningful literacy learning activities for their students involving technology.

Matched t-tests pairs were run to determine if there were significant differences in the post-semester survey as compared to the presemester survey. There were significant differences at the .05 level for the following areas:

- \( (p < .03) \) for familiarity with and capability with Internet searches for educational information
- \( (p < .001) \) for capability with chats and online Web discussions
- \( (p < .001) \) for familiarity with ITV and distance education, and development of technology for digital learning
- \( (p < .001) \) for familiarity with software programs designed for children to develop literacy skills
- \( (p < .03) \) for ability to check spreadsheet for classroom grading
- \( (p < .05) \) for familiarity with data analysis tools

Technology log results. Completed technology logs (seen in Figure 2) were handed in at the end of the semester. These logs were analyzed to report the number and types of technology used throughout the semester. The results show the peak of use and different types of use during October and November. They demonstrate the university students' use of technology during the middle months of the semester. After students started to learn more, their use of equipment increased. Figure 3 details the frequency and types of technology use reported by the students during the semester.

The technology the students most commonly made use of included the course website (245 times), e-mail (143 times), and Internet searches.

### Figure 3
**Frequency of use of technology**

<table>
<thead>
<tr>
<th>Program</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>Other</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Premier</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Cassette</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Digital camera</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>E-mail</td>
<td>35</td>
<td>39</td>
<td>40</td>
<td>29</td>
<td>143</td>
<td>689</td>
</tr>
<tr>
<td>Flow chart</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Front Page</td>
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<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ITV</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Individually named webpages</td>
<td>5</td>
<td>10</td>
<td>22</td>
<td>13</td>
<td>7</td>
<td>57</td>
</tr>
<tr>
<td>Internet searches</td>
<td>33</td>
<td>40</td>
<td>42</td>
<td>24</td>
<td>139</td>
<td>689</td>
</tr>
<tr>
<td>Microfiche</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Microsoft Paint</td>
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<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Microsoft Word</td>
<td>1</td>
<td>10</td>
<td>8</td>
<td>12</td>
<td>31</td>
<td>689</td>
</tr>
<tr>
<td>Overhead projector</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Palm Pilot</td>
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<td>PowerPoint</td>
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<tr>
<td>Scanner</td>
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<tr>
<td>Software</td>
<td>5</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>29</td>
<td>689</td>
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<tr>
<td>Spreadsheet</td>
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<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>TV/video</td>
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<td>1</td>
<td></td>
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<td>4</td>
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<tr>
<td>WebCT</td>
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<td>70</td>
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<td>37</td>
<td>245</td>
<td>689</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>151</td>
<td>207</td>
<td>197</td>
<td>126</td>
<td>8</td>
<td>689</td>
</tr>
</tbody>
</table>

Although not statistically significant, there were differences in survey responses concerning never attempting to develop meaningful literacy learning activities for the children they teach in their own classrooms or in their practicum experiences.
Defino Dinosaur Lab

Welcome to the Defino Dinosaur Lab! This month the first graders in Ms. Fahey's class and Miss Casola's class will be learning all about dinosaurs. Throughout March we will become scientists in the lab and paleontologists on digs to discover the fascinating world of dinosaurs. Defino Dinosaur Lab would like to invite you to see what we discover this month by coming to see our dinosaur play on April 5, 2001.

Click on me to practice our dino song!

Click on me to see a list of dinomite dinosaur sites!

Click on me to say hi to Ms. Fahey.

Click on me to say hi to Miss Casola.
(139 times). The next three most common were not used as extensively: Individually named webpages (57 times), word-processing programs (31 times), and different types of software (29 times).

Students listed the websites that they used on their technology logs. Those most frequently mentioned were as follows:

- Discovery School—http://www.schooldiscovery.com
- Scholastic—http://www.scholastic.com
- Enchanted Learning—http://www.enchantedlearning.com
- White House for Kids—http://www.whitehouse.gov/kids
- Reading Online—http://www.readingonline.org
- Encyclopedia Britannica—http://www.britannica.com
- Lesson Plans—http://www.lessonplans.com
- Lesson Plans—http://www.lessonplanspage.com
- Yahoo—http://www.yahoo.com
-Yahooolligans—http://www.yahooligans.com
- Ask Jeeves—http://www.askkids.com
- Eduhound—http://www.eduhound.com
- International Reading Association—http://www.reading.org

Interview data. The 10 randomly selected university students were interviewed at the end of the semester in person. Their responses were tape-recorded and written. Students who took part in the class answered questions about how the course was influencing their integration of technology with their present or future literacy instruction. The following are a representative selection of quotes from the interviews given by the 10 university students.

After completing this course do you feel any different about using technology in the classroom?

I feel more comfortable accessing information via the Internet and hopeful of using it frequently as part of my teaching. I will use it to set up a class website, encourage e-mails between myself and students and parents.

I was introduced to different software programs for literacy development such as Storybook Weaver. I will definitely use that software and other.

It improved our class and made it exciting; therefore I feel it is important to use with the children I eventually teach to give them the same exposure.

I was introduced to ITV, which I found we have in my school district, and I will definitely make use of this technology. I learned about a document camera that I would use when available.

How will you use technology in the classroom?

I will use it to create newsletters, story creations, presentations, science, social studies; the possibilities are endless.

I can use ITV to share projects with students in other parts of the world and compare data and research.

I will use it to have the children create their own story and illustrations with a program like Storybook Weaver.

The Internet can be used like the library of the future. I will use it for teaching children about research. Children can seek information and learn about things outside of their community or state and anywhere in the world.

I can create a website for my class and use it to post homework, and if anyone is sick they can see what we are doing through pictures. Also, they could get homework and even e-mail questions to the teacher.

I think ITV would be great for staff development.

The instructor received a letter from one university student after the course ended that demonstrated the knowledge she gained from participating in the course and how she was using that information.

Dear Dr. M.,

I hope you are well. Enclosed is a copy of the web page I just designed for my first graders about our upcoming dinosaur play. It is under construction right now. I wanted to send these to you to see what you think of them. I'd appreciate any suggestions. I'd also like to thank you for being the catalyst in all of this web exploration. As a result of your course, Literacy Development in the Early Years, technology just stands out in my mind, so I decided to do something about it. Thank you so much for stressing its importance in your course throughout the semester. It really motivated me to try it in my classroom. If you would like to visit the web pages please do so. You can find them at the following address: http://www.hometown.aol.com/krisfahey/dinosaur.html

Another university student described a project she undertook as a result of the exposure to technology in the early literacy course. This first-grade teacher partnered with a sixth-grade teacher in her school. The school was in an inner-city environment, and 90% of the children received free or reduced-cost lunch. The first- and sixth-grade teachers agreed to work on an integrated language arts unit on the theme of agriculture. The children learned about plants and how they grow and survive in different environments.

The children consulted a farmer in Missouri about their planting project. These children in Maryland planted the same seeds as the farmer in Missouri and then communicated through e-mail as to the progress of the plant growth. Sixth-grade children used the Internet to
Classroom vignette

I never could have anticipated the pedagogical and technological adventure upon which I was about to embark. When I entered the classroom I found a rich literacy environment. In addition, the classroom was equipped with sophisticated technology. The physical layout suggested that this was a true model of an early childhood classroom. I had never seen a classroom quite like this.

The print in the room included a calendar, weather chart, helper chart, and rules for the class. Signs communicated information such as “Take a folder when you arrive,” and “Leave your self-addressed stamped envelope on my desk.” There was a box called “Messages” that housed the message for the day that class members were to take on their way to their seats. A cork notice board on one wall was for posting news items, conference advertisements, and new book titles for children and teachers. A word wall included high frequency words and phrases that dealt with early literacy such as emergent reader, invented spelling, phonemic awareness, comprehension, family literacy, fluency, and phonics.

A small table held materials for reading instruction such as an assortment of leveled books, a pocket chart with sentence strips including the words of a poem to welcome the class, and an experience chart that provided directions for binding books. There was a stack of writing slates for working with words and writing. There was a folder for each of us with our name on it that contained materials we needed for class. On a shelf built into the wall were a few sample corrugated cardboard book bins, labeled with names of class members. These would be for storing journals, books being read, homework assignments, and other personal work. In this same area was a sign that read “Literacy Center.” On another shelf were books in baskets leveled for difficulty, and books labeled for themes and genres such as fairy tales, good health, animals, plants, and poetry.

There was a rocking chair, some stuffed animals, pillows, and a small area rug. There was a place for headsets with taped stories for listening. There were manipulatives to reinforce word study skills, magnetic boards, sandpaper and felt letters for building words, an alphabet puzzle for sequencing letters, and a bingo game for matching letters and sounds. There were materials for developing comprehension such as a felt board and roll movie for storytelling. The author’s spot included markers, pencils, crayons, and various types of paper. There were index cards for “Very Own Vocabulary” word collections, and notebooks for journal writing. Finally, there were materials for writing and mailing letters.

This environment was not only rich in literacy, but also in technology. The technology was woven seamlessly into the class. There was a large TV monitor at the front and six smaller monitors built high into the wall at the back. The rich technology environment also included a long table at the front of the room, which had a touch pad control panel that operated all of the equipment. Built into the table was a document camera, which is a cross between an overhead projector and an old-fashioned opaque projector. The document camera projects images of pictures or objects onto the screens. The book It Happens to Everyone (Myers, 1990), about the first day of school, was on the document camera. It could be seen on one of the smaller screens in the back and on one quarter of the large screen at the front. (The large screen was split into four sections.)

The desk in the front of the room was a typical teachers desk at first glance. But there was a computer built into it, and images from the computer could be projected onto the large TV screen in the front as well as on the smaller screens in back. When I entered, the computer displayed the class website that would be used by the instructor and class members between class sessions. The image of the website was on a second quarter of the screen in the front of the room and on one of the screens in the back of the room. Stored in the desk in the front of the room were software programs for early literacy development, a PowerPoint presentation created by the instructor, and a directory for recording student e-mail addresses. There was also a directory of teacher-suggested websites.

Next to the large TV screen in the front of the room was a cabinet with two VCRs, one for playing videotapes and the other for recording. A tape of a first-grade teacher modeling a guided reading lesson was playing on the third quarter of the TV monitor in the front of the room and on one of the televisions in the back of the room. The room also had the capacity for interactive TV (teleconferencing). On the fourth quarter of the large screen was a group of teachers 50 miles away. We could see and hear them as they assembled in their ITV classroom. They were taking this early literacy course with our instructor. Microphones were built into the ceiling so we could hear from the other site and they could hear us. The instructor had a wireless lapel microphone to be sure that her voice carried clearly.

I think the instructor used every piece of equipment during the first night of class. The class began with a PowerPoint presentation, a historical overview of literacy instruction in the United States over the past 100 years. The instructor used the document camera to display original pages from children’s materials beginning with the McGuffy Readers. She enlarged the images on the screen that illustrated the many types of reading instruction we have used over the years. The materials included texts that fostered reading development through the use of repeated sight words and controlled vocabularies. There were those that were phonics.

(continued)
 research plants and survival in different environments and then shared their information with the first-grade students. Each class participated in activities appropriate for their grade and had opportunities to share what they had learned. There was a website for the two classes to post their work. At the end of the unit the children were interviewed concerning the technology used during the project.

Quotes from students.
What did you know about computers and using the Internet before this unit?

I didn’t really know much about computers. I don’t own a computer. Now I know that you can send messages on e-mail and that the Internet is for finding information. The computer also types really good.—girl, age 12

I thought I knew what computers were used for, but I never had one myself, and I didn’t really know how to use them. I can’t believe all they can do. We really need to get computers in everyone’s house.—girl, age 8

Did the computer help you learn?

Yes, I learned a lot. I learned you could play games and learned how to type on the computer. You can also write to people and hear back from them really soon on e-mail, even if they’re really far away.—boy, age 7

Did you like using the computers and Internet?

Of course I did! I really didn’t know there was so much to know and learn on the Net. It would have taken so much more time to look for the information we needed in the library. We probably wouldn’t have found it all.—boy, age 12

Classrooms of the future

According to Symonds (2000), classrooms of the future will be equipped very much like the one used in this project or in even more sophisticated ways. In schools of the future students will carry wireless devices, teachers will collaborate with colleagues across the globe and rely less on textbooks, classrooms will have cooperative learning tables instead of rows of desks, and students will work together to solve problems. Distance learning will provide children with virtual field trips and the ability to meet and talk with people throughout the world, parents will exchange e-mails with teachers and view their child’s work online, tests will give way to electronic assessments, homework will be more individualized, and tutors will be available for online help. Some of these predictions are already realized. One cannot accurately speculate about what the future of technology will bring because it changes so rapidly, but most educators would agree that technology will take teachers and children further than most of us could ever imagine. It is an exciting time to be a teacher with so much change. We must embrace these changes with enthusiasm and great expectations.

The purpose of this project was to increase awareness about technologies available and how they can be used with children in literacy development programs. To do this the use of technology was integrated with an early literacy course that required class members to use different technologies in their assignments and in their teaching. The university students were exposed

Classroom vignette (continued)

oriented, with different decoding skills being taught on each page and structural linguistic approaches as well. The instructor enlarged the picture on the document camera to demonstrate a current strategy for building words with manipulative letters in word-study programs. We could see how she built the word chart by blending together the ch digraph on a letter card with the art phonogram. We watched a few short video clips of more current approaches to literacy instruction. The videos modeled first-grade guided reading instruction, organizing center instruction, and doing a running record.

We were introduced to our class website and we watched how to get online and post messages and how to chat with many students at once. We signed up for dates to discuss readings of the week on the site and to respond to comments made by others in the class. All the time, the professor was using the remote touch pad to work the technology.

After we introduced ourselves, the teachers from the distance site made their introductions. We talked about ITV etiquette, participation, and technical pros and cons of the interactive TV distance learning mode. There would be other groups dropping in during the semester for specific topics of interest to them.

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to numerous strategies and techniques to help children develop their abilities in reading, writing, listening, speaking, and viewing. The instructor’s use of technology was a model for the students to learn how to use it to support their own instruction of young children. Incorporating technology is no longer a special effect or idea; it is a necessity in preparing teachers for today’s and tomorrow’s world.

The project was successful in increasing the university students’ knowledge of different types of technology and how they are operated. It was also successful in broadening these university students’ use of technology in their work for the course and in their own classrooms. Most colleges, universities, and school districts have the types of technology described in this project. Those who try to use the equipment will learn that it isn’t as intimidating as it seems, it enriches teaching, and, most important, it enhances children’s learning. It is time to turn potential into reality and to use technology in classrooms in every way possible.

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