

Federal Programs to Increase Children's Access to Educational Technology

Linda G. Roberts

In society today, technology, education, and economic growth go hand in hand. Technological literacy is important not only to children's own future economic well-being, but also to the economic well-being of our nation. Technology can help expand opportunities for learners to improve their skills, maximize their potential, and ready them for the twenty-first century. Over the past seven years, the Clinton administration has focused on four goals for educational technology: (1) training teachers to use technology effectively in instruction, (2) ensuring that all teachers and students have modern computers in their classrooms, (3) connecting every classroom to the Internet, and (4) integrating high-quality software and online learning resources into every school's curriculum.¹

New federal programs inspired by these goals—along with changes in telecommunications policy, investments at the state and local level, and support of the high-tech industry—have resulted in great progress. For example, between 1993 and 1999, the percentage of classrooms with Internet access grew from 3% to 65%, and by the end of 2000, 100% of schools will likely be connected to the Internet.² Virtually all full-time regular public school teachers report they now have access to computers or the Internet in their schools, and about two-thirds say they are using the new technology for classroom instruction.³ And yet, despite this progress, more needs to be done. Among classrooms in the poorest schools, for example, only 39% were connected to the Internet. And two-thirds of the same teachers who have access to technology also say they are not well prepared for the task. At the federal level, several programs have been introduced to help meet this challenge (see Table 1). A key program helping to reduce the digital divide is the Education-rate (or "E-rate") program. Under a provision in the 1996 Telecommunications Act, the Federal Communications Commission is empowered to use the universal service mechanism to provide E-rate subsidies for telecommunications services and Internet connections for schools and libraries. Subsidies provided through this program have benefitted more than 80,000 schools and thousands of libraries, with the greatest assistance going to those with the greatest need. In addition, the U.S. Department of Education's Community Technology Center program hopes to improve access to technology for both children and their families in underserved communities by supporting the development of 1,000 centers across the country. As of 2000, funding has been provided to develop 450 such community technology centers, and more are planned for the future.

(Text continued on page 184.)

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Table 1

Key Federal Programs Supporting Children's Access to Educational Technology	
School and Library Access	<p>Education-rate ("E-rate") program: The E-rate program, administered by the Federal Communications Commission, provides \$2.25 billion annually for schools and public libraries to receive discounts on telecommunications services. Discounts range from 20% to 90%, depending on poverty and geographic location (the average discount is 60%). The goal of the E-rate program is to ensure that no school (public, private, or parochial) or library is left behind in the information age.</p> <p>See Web site at http://www.sl.universalservice.org.</p>
Community Access	<p>Community Technology Centers: U.S. Department of Education grants for community technology centers help bring the power of computers and information age resources to students and adults in greatest need, such as those living in low-income communities with no access to home computers, by providing access in public housing facilities, community centers, libraries, and other educational facilities. In 1999, the program's first year, a budget of \$10 million funded 40 grants, creating 100 centers in urban and rural areas, targeted to economically distressed communities such as empowerment zones and enterprise communities. In 2000, \$32.5 million will fund the creation of an additional 350 centers.</p> <p>See Web site at http://www.ed.gov/offices/OVAE/CTC/.</p>
Distance Learning	<p>Star Schools Program: For more than 10 years, the U.S. Department of Education's Star Schools program has supported distance-learning projects. These projects have helped to improve instruction in mathematics, science, and foreign languages, literacy skills and vocational education in underserved areas. The program promotes partnerships that develop, construct, acquire, maintain, and operate telecommunications, audiovisual equipment, and facilities, and partnerships that develop instructional programming. More than one million students and their teachers in 50 states and territories have participated in this program. In 2000, some \$50 million was made available for these distance-learning projects.</p> <p>See Web site at http://www.ed.gov/prog_info/StarSchools/index.html.</p>
Professional Development	<p>Preparing Tomorrow's Teachers to Use Technology: Over the next 10 years, two million new teachers will need to be hired and trained to use technology. To better affect the skills and effectiveness of this next cohort of teachers for schools in the twenty-first century, this U.S. Department of Education program awards grants to colleges, school districts, and state education agencies involving more than 1,350 partnerships with high-tech companies and nonprofit organizations. Beginning in 1999, the program's budget of \$75 million funded 225 grants to support planning, implementation, and the development of statewide initiatives and other national efforts to integrate technology into teacher preparation programs. Another 200 grants will be awarded in 2000.</p> <p>See Web site at http://www.ed.gov/teachtech/.</p>
Capacity Building	<p>Technology Literacy Challenge Fund: Under this U.S. Department of Education program, every state is provided funding through formula grants on the basis of population and poverty level for modern computers, high-quality educational software and online applications, trained teachers, and connectivity to the Internet. In addition, competitive grants are provided to consortia of schools, technology developers, and universities for developing new applications of technology and learning and for improved teacher training and teacher preparation. Since 1996, states have received \$1.475 billion from this fund to help schools integrate technology to reach challenging academic standards.</p> <p>See Web site at http://www.ed.gov/Technology/TLCF/.</p>
Innovation	<p>Technology Innovation Challenge Grant Program: In 1995, the U.S. Department of Education initiated a "Technology Learning Challenge" to encourage communities to form partnerships of local school systems, students, colleges, universities, and private businesses to develop creative new ways to use technology for learning. Since then, 96 multidistrict and multistate projects have been funded in 46 states (involving 744 partners, 381 businesses, 220 colleges and universities, and 520 community-based organizations and government agencies) to demonstrate the innovative uses of computers, networking, and multimedia across the curriculum. These grants have generated \$1.3 billion in matching commitments. In 2000, some \$146 million will fund continuation grants, earmarks, and some new projects.</p> <p>See Web site at http://www.ed.gov/Technology/challenge/.</p>

Table 1 (continued)

Key Federal Programs Supporting Children's Access to Educational Technology	
Research	<p>Interagency Education Research Initiative: Through this initiative, large-scale, interdisciplinary studies are being supported by an unprecedented partnership between the Department of Education, the National Science Foundation, and the National Institute of Child Health and Human Development. They made their first rounds of grants in 1999, totaling nearly \$30 million, and another \$38 million will be awarded in 2000. This investment will deepen understanding of how different types of students learn, how new knowledge about the human brain can help improve learning, and how best to incorporate new technology. Strategies for improving instruction will be tested at a scale that can provide statistically significant results, and ensure that research results are communicated effectively to local school districts. The goal of this research effort is to improve prekindergarten through 12th-grade student learning and achievement in reading, mathematics, and science. The work is intended to benefit students who, early on, are deemed to be at risk of school failure and who fail to acquire the higher-level skills needed to compete in the technology-driven workplaces of the twenty-first century. Particular attention will be given to the use of information and computer technologies to promote improvements in teaching and learning.</p> <p>See Web site at http://www.whitehouse.gov/WH/EOP/OSTP/Science/html/ieri.html.</p>
Technical Assistance	<p>Regional Technology in Education Consortia (R*TECs): This program, created in 1995 and funded annually with \$10 million through the U.S. Department of Education, supports regional consortia that help states, districts, and schools integrate technology with teaching and learning. The R*TECs provide professional development, technical assistance, and dissemination of information on the types and effective uses of hardware, software, and electronic networks to help students meet challenging academic standards.</p> <p>See Web site at http://www.rtec.org/.</p>

(Text continued on next page.)

To support better use of technology in the classroom, several programs place a central focus on teachers. The new Preparing Tomorrow's Teachers to Use Technology program that supports partnerships among colleges, school districts, state educational agencies, and high-tech companies will reach almost one-third of prospective teachers, enhancing their technological literacy and enabling them to integrate technology in their teaching. The Department of Education has also urged states to devote at least 30% of their grants from the Technology Literacy Challenge Fund to train teachers on how to use technology effectively in instruction, especially teachers in high-poverty, low-performing schools.

In fiscal year 2000, funding for educational technology through the E-rate and U.S. Department of Education technology programs reached an all-time high of \$3 billion. Despite this significant amount of funding for technology, federal investment in education is small compared to the overall investment at the state and local levels. Thus, each of the Department's technology programs attempts to encourage a cooperative approach by supporting the involvement and investment of state and local school districts and the private sector with the knowledge and resources held at the national level.

For example, to promote the sharing of information, President Clinton had the U.S. Department of Education create a Web site that serves as a gateway for access to learning resources from dozens of federal agencies. At the Federal Resources for Educational Excellence (FREE) Web site (<http://www.ed.gov/free>), teachers now can access materials with direct relevance to their classrooms, students, and subjects of study—including images, data, video links, lesson plans, original source materials, and a powerful search engine—from a single Web location. The heavy traffic to this site speaks to its usefulness as a resource for K–12 classes. Along with <http://www.ed.gov/technology>, FREE is one of the most popular pages on the department's Web site.

Cooperation between the private and public sectors also is critical to developing high-quality educational technology resources. The Technology Innovation Challenge Grants have enabled school districts to partner with research laboratories, universities, software and hardware developers, and telecommunications entities to develop applications of technology across various subjects in the curriculum. In the Lemon Link Project, for example, the Lemon Grove School District has embarked on a communitywide effort to raise student achievement and students' and parents' technology skills by using advanced telecommunications devices that are networked between school and home. In addition, a key goal of the Interagency Research Initiative is to advance the next generation of interactive learning tools through research and development activities that bring together the academic disciplines and front-line technology expertise. Reading instruction is one of the most promising areas for new development, not only because of the substantial knowledge base about the acquisition of reading skills, but also because new technological capabilities, such as speech recognition, are under development.⁴

Federal programs that work strategically with state- and local-level partners in both the public and private sectors offer the best chance of success. Through such cooperative efforts, all our nation's children can be provided access to educational technology and the computer skills they need to become productive and engaged citizens in the twenty-first century.

1. U.S. Department of Education. *Getting America's students ready for the 21st century: Meeting the technology literacy challenge*. Washington, DC: U.S. Department of Education, June 1996.
2. National Center for Education Statistics. *Survey of advanced telecommunications in U.S. public elementary and secondary schools*. Washington, DC: NCES, 1997, 1998, 2000.
3. National Center for Education Statistics. *Teacher use of computers and the Internet in public schools*. Washington, DC: NCES, April 2000.

4. Research studies, such as the recent National Research Council report *Preventing Reading Difficulties in Young Children*, can have broad influence, especially if the states and districts bring these findings to the attention of developers and provide clear signals about market demand. See National Research Council. *Preventing reading difficulties in young children*. Washington, DC: NRC, 1998.

APPENDIX
B

<http://www.futureofchildren.org>

What Children Think About Computers

Amidst the research, policy, and advocacy regarding children's use of technology, children's own thoughts about the role computers play in their lives are often neglected. To provide a glimpse of what some children and teens think about computers, we tapped the creative minds of children at Plugged In, a community technology center serving low-income children in East Palo Alto, California. Founded in 1992, Plugged In runs several programs designed to help children benefit from computer use, including a Web page design business created and run by teens, an after-school program, a community technology program for teens and adults, and general computer skills courses.¹

To survey young Internet users about their experience with and perceptions of computer technology, teens in Plugged In's Web design program developed an online survey.² Children from Plugged In and a second computer technology center, The Computer Clubhouse in Boston, Massachusetts, were given the opportunity to log on and complete the survey. The Computer Clubhouse was founded in 1993 in conjunction with the MIT Media Lab. It is similar to Plugged In in that it provides an after-school learning environment for children and teens to work together with adult mentors as they develop ideas, skills, projects, and confidence through the use of technology- and nontechnology-based resources, tools, and materials.³

Seventy-two children from Plugged In and The Computer Clubhouse, ranging from ages 5 to 18, logged on to the youth-created Web site in late 1999 and early 2000 to share their perceptions of computer technology. Although reflecting the thoughts of only a small number of children and with no scientific claim to represent all children's thoughts about computer technology, the survey results nonetheless provide a window into what is on children's minds. Similar to the findings of the much larger surveys detailed in this journal issue, the survey responses indicate that children participate in a variety of computer-based activities. These activities range from traditional educational projects, such as writing fiction and nonfiction, doing research for school, and benefiting from homework help, to the newer pastimes of writing e-mail, chatting online, programming, and creating Web pages. Favorite activities included playing games, drawing pictures, writing letters, and surfing the Web (see Box 1).

Besides asking children about their basic experience and favorite activities, the survey also asked about their difficulties and frustrations with technology. Many of the Plugged In and Computer Clubhouse respondents wrote about the same problems that plague adults, such as the time it takes for computers to boot up and go online, react to commands, and complete downloads. Children also recounted difficulties setting up and communicating with computers, and frustrations with computers freezing or crashing (see Box 2).

Despite these regular frustrations, nearly all of the respondents from both Plugged In and The Computer Clubhouse reported that they valued the role of computers in their lives. Children commented that computers provide them with entertainment, a tool for accomplishing a goal, and a vehicle leading toward present and future competence, autonomy, and empowerment (see Box 3). Although nearly all the children said they had access to computers at school, more than 40% said they did not have access to a computer at home.

A nationally representative telephone survey of children revealed similar thoughts about computers. The survey included more than 600 10- to 17-year-olds and was conducted in December 1999 by National Public Radio in partnership with the Kaiser Family Foundation and the Harvard University John F. Kennedy School of Government.⁴ Although nearly one-half of the children surveyed complained about the length of time it takes for computers to respond and the frequency of breakdowns, almost all believed that the computer made life better for Americans, and most felt the same about the Internet (see Table 1). Among children with no access to home computers, 42% said that it was a problem and 37% said they felt left out because of it—significantly greater ratios than adults who responded to the same questions.

Children have much to say about why it is important for them to have computers—from 8-year-old Irshad, who explained that with computers, children can “. . . learn more things, and they’ll be learning and having fun at the same time” to 13-year-old Anneika, who stated that “. . . computers will be the future, so if you grow up with it, then you will know it.” The voices of children can help enrich and enlighten discussions on the role of technology in our lives. We should take the time to listen.

Special thanks to the teens in Plugged In’s Web design program for their creativity in developing the survey Web site; to all the children who took the time to share their thoughts; and to Magda Escobar, executive director, Plugged In; and Stina Cooke, program developer, The Computer Clubhouse, for their enthusiasm and support of this project. The information in this appendix was compiled by Elise Cappella, research assistant.

1. See Plugged In’s Web site at <http://www.pluggedin.org>.
2. The Plugged In online survey can be accessed at <http://www.pluggedin.org/kidsurvey>.
3. See The Computer Clubhouse Web site at <http://www.computerclubhouse.org>.
4. National Public Radio, Kaiser Family Foundation, and Harvard University John F. Kennedy School of Government. *Survey shows widespread enthusiasm for high technology*. Survey results featured on NPR’s radio program, *All Things Considered*, February 29, 2000. For more information, see the NPR Web site at <http://www.npr.org/programs/specials/poll/technology/index.html>.

(Boxes 1 through 3, and Table 1 follow on next four pages.)

Box 1

Things Children Like About Computers

What projects have you done on computers?

"I [did] a picture and I color." (Karla, 7, Plugged In)

"At Computer Clubhouse, I've created music and art." (Vo, 9, Computer Clubhouse)

"[I] look up black history people." (Billy, 11, Computer Clubhouse)

"We wrote about our ancestors, we drew pictures and typed on the computers and stuff, and we did poems on the computer...We wrote articles about things that were happening in East Palo Alto." (Soni, 11, Plugged In)

"[I do] research papers on Louis Pasteur and find out what goes on in circuses..." (Krissie, 12, Computer Clubhouse)

"I use the Internet to find out about people, then write an essay for school." (Melissa, 13, Computer Clubhouse)

"I helped renew the Sandhill Challenge Web site, and I've made a few images in 'photoshop' and worked on my friend's Web page-also [on] mine." (Frank, 18, Plugged In)

What is your favorite thing to do on computers?

"Play with my friends on the computer." (Ronald, 5, Plugged In)

"Play games like soccer." (Maria, 8, Plugged In)

"Play a game called Starcraft which is a strategy game." (Marcel, 11, Plugged In)

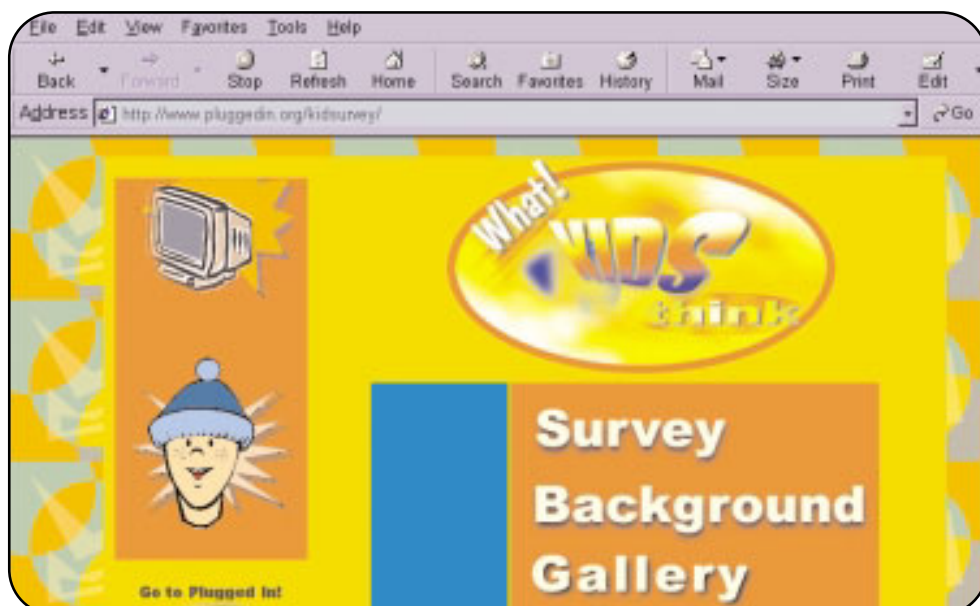
"I like to write letters to my family and go on the Internet." (Salihah, 12, Computer Clubhouse)

"Surfing the Internet, making Web sites, playing multiplayer games." (Zyna, 12, Computer Clubhouse)

"Surf for Sarah Michelle Gellar pictures." (Charlie, 13, Computer Clubhouse)

"Work on homework, chat, and play games." (Kenneth, 15, Plugged In)

Source: Plugged In Web site survey. For more information, see Web site at <http://www.pluggedin.org>.



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Box 2

Things Children Don't Like About Computers

What is the most difficult thing about computers?

"Turning the computer on. Sometimes when it's not off all the way, you have to click 'OK' and start it all over." (Preshia, 7, Plugged In)

"You have to decide what program to go into." (Brianna, 9, Plugged In)

"Making them from scratch." (Eddie, 10, Computer Clubhouse)

"Bootting up-~~it~~ takes too long." (Adrian, 11, Computer Clubhouse)

"They don't work, they don't listen, they will not do [anything]. I tried to fix it, but it didn't work." (Iluvia, 10, Plugged In)

"The most difficult thing is they often break and [they are] a pain to fix." (Mikhael, 13, Plugged In)

"Getting to most of the sites that you want to go to." (Natasha, 13, Computer Clubhouse)

What bugs you about computers?

"I don't like when the computer doesn't work-~~that~~ makes me mad." (Rey, 6, Plugged In)

"You need a password." (Ronald, 9, Plugged In)

"Most of the time getting stuck in different Web sites." (Asja, 12, Computer Clubhouse)

"Sometimes when you're very specific and you still can't get it right." (Anneika, 13, Computer Clubhouse)

"When it doesn't do what I want it to do, and viruses." (Hermese, 13, Computer Clubhouse)

"Sometimes they might freeze or have one of those system errors messages." (Noel, 14, Plugged In)

"What bugs me about computers is ..when I'm working on something and it freezes." (Jesus, 15, Plugged In)

Source: Plugged In Web site survey. For more information, see Web site at <http://www.pluggedin.org>.

The "What Kids Think" Website

What is your first name?

How old are you?

What city are you from?

Where do you live now?

Are you a boy or a girl? boy ☐ girl ☐

* please don't hit the enter key after you fill in each question, hit the tab key

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Box 3

The Importance of Computers in Children's Lives

Do you think it is important for kids to have computers to work and play on? Explain why or why not.

"Yes, 'cause it's fun and it's important to the kids. 'Cause they make you feel happy and they make you feel good and they listen to you." (Kassandra, 6, Plugged In)

"Yes. When the kids are bored they can play games and if they want to do something important they can do it on the computer .like if they want to [make] a really important note for their mom or their dad." (Javier, 8, Plugged In)

"Yes, . . . [because] outside there might be bullies who want to mess with you. That's why it's better to play on the computer." (Alex, 8, Plugged In)

"Yes. So that [you] can learn what you can't learn at school." (James, 10, Computer Clubhouse)

"Yes, because you can do a better job if you have sloppy handwriting." (Donzelle, 10, Computer Clubhouse)

"Yes, so you can learn more about them, so you can be a good computer genius." (Deven, 10, Plugged In)

"Yes, because they might have a project that has to be typed for their grade or if you need to do research on a certain person or something like that. That's why I think it's important for kids to have a computer to work and play on! Every kid [should] have a computer." (Carlan, 11, Computer Clubhouse)

"Yes, because [in] most jobs when you grow up, you have to work with computers and you want to know what to do. This way you have experience." (Kaitlyn, 11, Computer Clubhouse)

"Yes .because if you are typing a paper for school on a typewriter and you mess up, you have to start over, but on a computer you can backspace to delete stuff. And games are fun on the computers." (Bobby, 12, Computer Clubhouse)

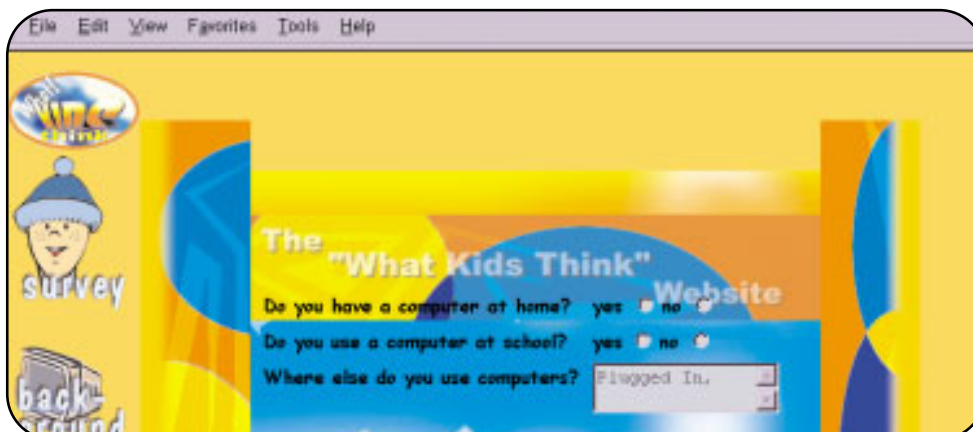
"Yes. Computers stop kids from staying hours at the library and it helps them to do their homework faster." (Hermese, 13, Computer Clubhouse)

"Yes. It is important for our youth to be good at something." (Jerone, 14, Plugged In)

"Yes. Computers open up a world of knowledge and information." (Omar, 16, Plugged In)

"Yes . . . because computers are something positive, and kids at a young age should be subjected to positive things instead of something that is negative." (Weslina, 17, Plugged In)

Source: Plugged In Web site survey. For more information, see Web site at <http://www.pluggedin.org>.



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Table 1

Results from NPR/Kaiser/Kennedy School "Kids and Technology Survey"				
When it comes to computers, how annoyed are you about each of the following things?				
	A Lot	A Little	Not at All	Don't Know
Junk e-mail	53%	23%	20%	3%
Not finding the information you want	49%	40%	11%	<1%
How long some things take to work	49%	40%	12%	<1%
How often computers crash or freeze	47%	36%	15%	2%
Programs that are hard to use	36%	47%	17%	<1%
How much computers, software, and services cost	34%	42%	22%	2%
Always having to upgrade software	27%	45%	26%	2%
For each of the following technologies, please tell me if you think it is making life better or worse for Americans, or if it isn't making much difference?				
	Better	Worse	No Difference	Don't Know
Computers	91%	2%	6%	<1%
The Internet	80%	7%	12%	1%
Cellular Phones	65%	11%	23%	1%
Television	35%	30%	35%	<1%

Source: National Public Radio. NPR/Kaiser/Kennedy School Kids and Technology Survey. NPR Online, February 29, 2000. Available on the NPR Web site at <http://www.npr.org>.

Glossary of Selected Terms and Acronyms

- **CD-ROM:** Compact Disc Read-Only Memory. A type of optical disk capable of storing large amounts of data.
- **Chat or Chat Room:** A virtual room on the Internet where real-time communication between two or more users takes place via computer. Once a chat session has been initiated, users enter text with their keyboards and the text then appears on the other users' monitors.
- **Cognition:** Refers to how we know the world, as in the mental processes such as thinking, perceiving, and remembering.
- **Constructivism:** A theory that existing knowledge is used to build new knowledge. In a constructivist classroom, the teacher searches for students' understandings of concepts, and then structures opportunities for students to refine or revise these understandings by presenting new information and encouraging research.
- **Cyberspace:** A term coined by William Gibson in his novel *Neuromancer*. The term *cyberspace* is currently used to refer to the digital world constructed by computer networks.
- **Digital:** Describes any system based on discontinuous data or events. Computers are digital machines because they can distinguish between just two values, zero and one, in all the data they process.
- **E-commerce:** Conducting business over the Web, including the buying and selling of goods and services.
- **E-mail:** Electronic mail. Messages, usually text, sent from one person to another via computer. E-mail can also be sent automatically to a large number of addresses (see Listserv).
- **Edutainment:** Computerized entertainment comprising both education and entertainment.
- **Hardware:** The many components of a personal computer. Includes disks, disk drives, display screens, keyboards, and printers.
- **HTML:** Hypertext Markup Language. The coded format used to create documents on the World Wide Web.
- **HTTP:** Hypertext Transfer Protocol. The protocol used by the World Wide Web. HTTP defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands.
- **Hyperlink:** Links in HTML documents that users click on to go to other Web resources.
- **Hypertext:** A document that contains links to other documents, as commonly seen in Web pages and help files.
- **Icon:** A small picture that is displayed on the screen, intended to depict pictorially a task that can be invoked when clicked with the mouse.
- **Internet:** A global network connecting millions of computers through a collection of networks and appearing to users as a single network.
- **Listserv:** An electronic mailing list typically used by a broad range of discussion groups. When users subscribe to a listserv they receive periodic e-mail messages about a specified topic, and can communicate with each other.
- **Message Board:** Internet "bulletin boards" where users who share a mutual interest "post" answers, comments, or questions.
- **Modem:** Modulator-demodulator. A device or program that enables a computer to transmit data over telephone lines.
- **MUD:** Multiuser Domain. A cyberspace where users can take on an identity and interact with one another.
- **Multimedia:** A combination of media types on a single document, including text, graphics, animation, audio, and video.
- **Portal or Web Portal:** A Web site or service that offers a broad array of resources and services, such as e-mail, forums, search engines, and online shopping malls.
- **Simulation:** The process of imitating a real phenomenon. Prevalent in video games, which often simulate real-life situations. Advanced computer programs can also simulate weather conditions, chemical reactions, atomic reactions, even biological processes.
- **Software:** A series of computer instructions or data that can be stored electronically. Systems software includes the operating system and utilities that enable the computer to function. Applications software includes word processors, spreadsheets, and database management systems.
- **Surfing:** Moving from place to place on the Internet searching for topics of interest.
- **URL:** Uniform Resource Locator. The global address for documents—or Web sites—on the World Wide Web, such as <http://www.futureofchildren.org>.
- **World Wide Web (WWW):** The hyperlinked text- and graphic-based part of the Internet.

Sources: Bransford, J., Brown, A., and Cocking, R., eds. *How people learn: Brain, mind, experience and school: Expanded edition*. Washington, DC: National Academy Press, 2000; Mischel, W., and Mischel, H. *Essentials of psychology*. New York: Random House, 1977; Brooks, J.G., and Brooks, M.G. In *Search of understanding: The case for constructivist classrooms*. Revised edition. Alexandria, VA: Association for Supervision and Curriculum Development, 1999; <http://www.eecomunications.com>; <http://www.homepages.enterprise.net>; <http://www.matisse.net>; <http://www.squareonetech.com>; <http://www.webopedia.internet.com>; and <http://www.wvli.com>.

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Children and Computer Technology

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