



NCSALL Home > Publications > Review of Adult Learning and Literacy  
> Volume 1 (1999) > Full Chapters > Using Electronic Technology in  
Adult Literacy Education

---

This page is located at: <http://www.ncsall.net/?id=519>

## **Using Electronic Technology in Adult Literacy Education**

Volume 1: Chapter Eight

**David J. Rosen**

Students in adult literacy education, including basic and secondary education and English for speakers of other languages (ESOL), are increasingly using computers to write, find information, publish their writings, communicate by e-mail, learn basic skills, and for other purposes.

### **RANGE OF TECHNOLOGIES**

Computer hardware and software can be found to varying degrees in almost all adult literacy programs, and to some extent literacy programs also have access to the Internet, especially e-mail, electronic lists, and the World Wide Web. Nevertheless, only about a third of adult literacy programs would describe themselves as engaged in significant use of computers for any purposes, and fewer than half use computers often or daily for instruction preparation activities (Sabatini, 1997).

Most programs have videocassette recorders and televisions (Turner, 1998), although, as Roberts (1993) points out, these are often underused. Some programs also have video cameras. Most programs, and many students, have audiocassette recorders. Newer kinds of technology, such as digital cameras, scanners, and CD-ROM recorders, are found less frequently. A few programs, especially those in community colleges and public schools, use two-way, interactive video broadcast equipment for instruction and sometimes teacher training. Some students use pocket calculators, spell checkers, and other personal data assistants.

In this chapter the focus is on computers, the Internet (including the World Wide Web), and, to a lesser extent, broadcast and recorded video technologies. Once separate electronic media, computers, the Internet, television, radio, and audio and video recordings are becoming an integrated, digital multimedial delivered now through the computer and

soon by digital television broadcast. By some estimates, nearly all U.S. homes will be wired to the Internet early in the twenty-first century (Kaku, 1997). The capacity for an integrated and interactive electronic learning medium of hypertext, still and moving images, and sound to be delivered at high speed to home, work, or learning center anytime, almost anywhere, in real and asynchronous time, opens a new era of learning and teaching possibilities for adult literacy education.

### **USING TECHNOLOGY FOR LEARNING AND TEACHING**

Although technology is used in adult literacy education for many purposes-information management, e-mail and electronic list communication, curriculum development, assessment, evaluation, and research, among others-one of its most important uses is to enable and strengthen teaching and learning.

Technology used in support of learning and teaching can be divided into two broad categories: instructivist and constructivist. The instructivist approach is widely found in adult literacy education technology laboratories and classrooms where learners use computer-assisted instruction to acquire knowledge and skills. Education programs may take one or both of two paths to computer-assisted instruction: by using large, comprehensive, often costly computer-based curricula, usually referred to as integrated learning systems, and by integrating specific single pieces of software, Web pages, or on-line documents into existing (or new) curricula. For those choosing the second path, a major issue is software integration. Challenges include how to identify good software that can meet defined purposes for different types of learners and how to find the time to review software and test it out with students before purchase.

Although an instructivist approach emphasizes computer-assisted teaching of skills or knowledge, most teachers also show their students how to use computers as tools, especially for word processing. Some teachers introduce students to spreadsheet, database, communications, graphics, desktop publishing, and presentation software, especially for job-related basic skills learning.

Constructivism is a theory of cognitive growth in which learning is believed to be an active process in which a person constructs new ideas or concepts while transforming his or her existing knowledge. Meaning is believed to be made from one's experiences and from a cognitive structure based on those experiences. A learner constructs knowledge by actively connecting and assimilating new information or experience into his or her existing knowledge structure. The new knowledge or ideas become useful and integrated as the learner sees relationships among

existing concepts and knowledge and the new ideas. The learner selects and interprets information, constructs hypotheses, and makes decisions by relying on a cognitive structure of schema, or mental models. The roots of constructivism go back at least as far as the eighteenth century, to German philosopher Immanuel Kant, and more recently have grown from research conducted by Swiss psychologist Jean Piaget (1973). Other theorists and adherents include Bruner (1986, 1990), Papert (1993), Resnick (1989), and Vygotsky (1978).

The constructivist approach as applied in the classroom is referred to as project-based, student-centered, participatory, engaged, cooperative, or inquiry learning. It begins with a question, problem, topic, or product of high interest to students. The subject decided on is then organized into a project with specific goals and products through which basic skills can be acquired. Technology plays many important roles in constructivist learning: students use CD-ROM encyclopedias, dictionaries, and other research tools, as well as the Internet, to search for answers to their questions; they use computers to do word processing and publish the results of their projects; and they use presentation software to show their projects in class and in the community. Depending on the project, they may also make tables, charts, graphs, spreadsheets, and databases. To improve practice in reading and writing, many programs provide students with "key pals" (electronic pen-pals) or encourage them to participate in real-time conversations in on-line electronic forums or chats.

Both instructivist and constructivist approaches have value, and teachers often use a combination if their goal is to enable learners to acquire a specific body of content and skills and also to engage in learning in meaningful and motivating contexts.

### **Examples of Technology Products for Instruction**

Public television has created several major products for adult literacy and ESOL instruction. Kentucky Educational Television has a series of videotapes (the KET/GED Video Series) for GED (General Education Development) and pre-GED students that it broadcasts on GED on TV. Intelcom's Crossroads Café and Boston's WGBH Connect with English are now widely broadcast throughout the country on public television stations. The broadcasts, accompanied by print materials, can be purchased on videotape, and students can record them for home use free of charge. A new and promising project being piloted in four cities is produced by the Adult Literacy Media Alliance. Described by some as the Sesame Street for adults who want to improve their basic skills, it will be available in broadcast and videocassette formats for use at home, school, work, and other places in the community.

There are numerous software products for adults available on computer

disk and more recently on CD-ROM. One worth special mention is the English New Reading Disc, which offers instruction for basic-level literacy students in a constructivist context in which they learn to read by writing articles, letters, and responses to debates.

The Internet holds great potential for adult literacy instruction. Although student access is still limited, as costs come down and the Internet becomes integrated with television, it will be more widely available in students' homes, at work, as well as in classes. One of the first organizations to develop adult literacy Web-based learning was California's Outreach and Technical Assistance Network (OTAN). The California Distance Learning Project (CDLP) now includes several good examples of interactive, on-line reading materials. (Addresses for CDLP and other Web sites mentioned here are listed at the end of the chapter.) Among them is the San Francisco CNN Stories for New Readers. This site has full-text CNN stories with graphics. It also offers a simplified text edited for low-level readers, an outline of the story, and a variety of on-line interactive lessons with an immediate on-line answer-check feature. All text has a RealAudio option so learners can hear it read aloud. In January 1999 the site had sixty-five stories. Other CDLP features include the Voter Involvement Project, the E-mail Projects page, and nearly thirty family, community, and work-related on-line interactive lesson topics. LitLink, a new Web site sponsored by PBS and the National Center for Adult Literacy (NCAL), offers promise especially for adult secondary education learners. The site's PeerLit section includes reviews of Web sites offering adult instruction on-line. Finally, integrated learning systems such as Invest/Destinations and PLATO (comprehensive computer-assisted and computer-managed instruction software) are planning conversions to Internet-based delivery systems of computer-assisted instruction.

Many Web sites offer adult ESOL (or ESL) lessons on-line. Among those with the most content is Dave's ESL Café, which includes an ESL Idiom page and a Quiz Center. Another site rich in content and especially suited to advanced ESOL students is the HUT Internet Writing Project. Many of these ESOL sites can be found through the ESL Loop, a chain of Web sites focusing on ESOL content. A list of Web sites (and other useful on-line resources) for ESOL and ABE can be found on the Literacy List, a set of Web page links for adult basic and secondary education and ESOL teachers.

### **Constructivist Applications**

One of the most interesting applications of technology in adult literacy involves the use of Web sites and computer tools for constructivist learning. Susan Gaer, an ESOL teacher at Santa Ana College in southern California, pioneered this work in adult ESOL learning with an

international adult learner cookbook that is published on-line annually. Her projects and others, which are linked on the E-mail Projects Web site, include a range of student writings. Examples include strategies for dealing with stress, home remedies, home buying, cost-of-living comparisons in various parts of the country, and intergenerational writings. Each project involves English-language learning and student writings published on-line. In some projects students from two or more sites work together, using the Internet to communicate. Some of the Web pages are interactive, allowing readers to add their own comments. Another proponent of constructivist approaches, particularly project-based learning in the natural sciences, is Susan Cowles, literacy leader fellow at the National Institute for Literacy (Cowles, 1997).

A growing area of constructivist Internet use in adult literacy education is variously called student inquiry, information searching, or simply research. Although there are only a few examples of adult inquiry or research projects on the Web pages,<sup>1</sup> students in many programs are using CD-ROM encyclopedias and other CD-ROM references, and they are increasingly searching the Web for information.

#### **CHALLENGES FOR POLICYMAKERS AND PRACTITIONERS: ACCESS, PLANNING, STAFF DEVELOPMENT, AND POLICY**

Four challenges must be met before these new technologies are well integrated and used systematically and effectively in adult literacy education. First is access for teachers and students to hardware and software. Although there are many barriers to access, including limitations on physical space and the availability of telephone or fiber-optic cable, inadequate funding is the primary barrier. In most public elementary and secondary schools, where several thousand dollars are spent per student annually, there is still inadequate student and teacher access to technology. And in most states, adult literacy education is a poor cousin to elementary and secondary education; nationally, the total expenditure per adult student is still well under \$300 annually. Thus the problem of access to technology in adult literacy education is many times as great as it is in K-12 public schools. In his study of computer use in midwestern states in 1997, Sabatini reported that in more than half of the adult literacy programs, nearly all teachers have access to computers, but only a third of the programs responding said that teachers use computers for instructional preparation activities, such as planning, assessing student work, and preparing course materials. Only a fourth of the programs reported the use of computers for instruction. This suggests that although adult literacy programs now have some access to computers, the access they have is not adequate for teachers' daily, practical use.

The best news for adult literacy programs-and teachers and students-is that the price of computers and some peripherals has dropped. This means that as resources for technology increase, the programs will get more value for their money. In many areas of the country, businesses and other organizations offer used (and in some cases refurbished) computers to nonprofit organizations at even lower costs. Because most students and many teachers cannot afford a computer at home yet, these essential tools need to be provided elsewhere: in programs, in libraries, and at other public places where access is free or available at low cost. This can be accomplished only with significant additional funding for hardware and software. One promising development is community computing centers, which are located in adult literacy programs, libraries, housing developments, community centers, and even in stores in shopping centers. Free or low-cost technology centers enable adult learners and other community members access to computers and the Internet, and the centers often provide free or low-cost training as well. One national organization, the Community Technology Centers Network (CTCNet), encourages the use of computers and provides technical assistance for nearly three hundred member programs across the country.

Another problem, teacher access to video- and audiocassettes, is being addressed in some communities. In the Los Angeles Adult Schools, for example, where thousands of adult learners are on waiting lists, there is a major effort to distribute instructional videotapes to those not able to enroll in classes. In Sacramento, California, in Boston, and elsewhere, cable TV broadcasts are used to deliver instruction.<sup>2</sup>

The second challenge is planning. Technology planning is a process that takes place at the local program, school, or agency level or at the state level, which produces a set of goals, objectives, activities, and projected resources for using technology for a variety of educational purposes. It is important at all levels because it engages a variety of stakeholders in envisioning not only what technology will be purchased but for what purposes it will be used and how it will be maintained. Those who have done this planning often find that they are able to get the public or private sector resources they need to carry out their plans.

Many states now have statewide technology plans for elementary and secondary education. Few of these K-12 plans include adult literacy education, however, and those that do include it do so as an afterthought. To date, only four states (Massachusetts, Texas, Arkansas, and California) are known to have begun statewide adult literacy technology planning processes, and only Massachusetts has implemented and funded a statewide literacy technology plan. At the program level, however, technology planning takes place in several states, including Pennsylvania, California, New York, and Massachusetts. This planning

has sometimes brought in increased funds from the private sector, but so far it has not often resulted in additional funds for adult literacy technology from the state or federal government.

The National Center for Adult Literacy at the University of Pennsylvania pioneered program technology planning in adult literacy programs, and it has developed several good documents related to technology planning (Hopey, 1998). Several years ago NCAL brought technology planning to programs in Pennsylvania and New York. The Brooklyn Public Library Adult Literacy Program, with NCAL, became one of the first to publish its plan in 1995, and since then it has been a model for other programs. Drawing on this experience, Massachusetts now requires technology plans from all adult literacy programs funded by its Department of Education and provides funding for technology to adult literacy programs with approved plans. The Massachusetts Adult Literacy Technology Team has produced a statewide, three-year technology plan that the Department of Education has funded with nearly \$4 million. Texas and Arkansas also have statewide plans under way.

The third challenge is staff development for teachers and other practitioners. To use technology well, teachers need to be properly introduced to the use of computers, and they need paid professional time to learn and practice their new skills. Some teachers may also need special attention to overcome their anxiety about using computers. Initial and ongoing training and technical support are necessary, but they are usually the exception rather than the rule in adult literacy practice.

In 1995 the National Institute for Literacy launched its Literacy Information and Communications System (LINCS) with a national Web page and four regional centers of technology activity covering the entire country and its territories. These centers (EasternLINCS, SouthernLINCS, WesternLINCS, and MidwestLINCS) have provided Internet technology training for representatives of organizations in their member states. MidwestLINCS, for example, has for several years offered training, including special initiatives at the program level. And EasternLINCS, in collaboration with the Literacy Assistance Center of New York City, has offered regional training for programs in New England and New York in Web use and Web page design.

Other organizations offer staff development, including NCAL, the Outreach and Technical Assistance Network, and state literacy resource centers such as the Massachusetts SABES, the Ohio Literacy Resource Center, and the Illinois Resource Development Center. These have largely relied on state or special federal funding.

Two-way, interactive broadcast and Internet technologies have been used

for staff development. NCAL and PBS, for example, have offered several national adult literacy training teleconferences. The Massachusetts Corporation for Educational Telecommunications, with the Massachusetts System for Adult Basic Education Support, has offered regular interactive broadcasts across the state for staff development, many of which were also interactive instruction supplements for students. Recently staff development courses in adult literacy and ESOL have become available from universities on the Internet.

One of the most exciting trends in staff development has been the use of electronic lists. These free e-mail lists enable members to send a single message that reaches all subscribers. Through them, adult literacy practitioners and other adult literacy experts raise and answer questions in daily public forums only an e-mail message away. The National Institute for Literacy now sponsors specialized electronic lists, focusing, for example, on literacy in the workplace, adult learning disabilities, literacy for the homeless, and family literacy.<sup>3</sup>

The fourth great challenge is public policy, especially federal technology policy, which excludes some kinds of adult education programs from funding. One example is federal policies that do not allow certain adult literacy programs—those in community-based organizations, churches, corrections institutions, colleges, and venues other than public schools and libraries—to benefit from the E-rate (a rate supported by federal policy that provides deep discounts in Internet connectivity costs for public schools and libraries). Another example is the federal literacy challenge grants, which are directed almost entirely toward K–12 education.

## **CONCLUSION**

Almost no research exists on the effectiveness of technology in adult literacy education. We do not have answers to questions like these: Does the use of technology enhance learning, and, if so, what kinds of learning, and how? Does it increase learners' persistence in their studies? Does it help them become more employable? Can students use technology effectively to learn at home or at work, and, if so, under what conditions? Will the use of technology enable us to serve more students?

Researchers and policymakers alike want to know the answers to these questions, but there are almost no resources now devoted to this kind of research. In addition, policymakers who are concerned about access and good use of these technologies must address the issue of resources, in terms of both widening the reach of the public resources that now cover only K–12 and creating new national and state adult literacy technology funding initiatives. The goal for policymakers must be to have computers as readily available to adult literacy learners as they are to college



students.

Finally, practitioners who use technology need staff development to become comfortable with and adept at using it. Such an effort needs to go beyond training in the use of hardware and software to focus on integration of technology in support of curriculum and instruction. It must also enable creative, constructivist uses of technologies in support of student inquiry and student project-based learning, and it must enable teachers to see beyond the classroom, to create new models for learning in a digital multimedia learning environment.

## Notes

1. One kind of Web-based inquiry project is the student-made inquiry map, a short research project, based on learners' own questions, that uses a variety of sources, including the Internet. Web-based examples of inquiry maps can be found at [<http://www2.wgbh.org/mbcweis/ltc/alri/I.M.html>].
2. The Los Angeles and Sacramento examples were provided by OTAN director John Fleischman. The Mayor's Office of the City of Boston sponsors Speak Easy, an ESOL cable broadcast program.
3. For adult literacy electronic list addresses, see [<http://www2.wgbh.org/mbcweis/ltc/alri/LiteracyList.html>].

## Resources

### Resources on the Web

California Distance Learning Project (CDLP):  
[<http://www.otan.dni.us/cdlp/cdlp.html>]

Community Technology Centers Network CTC-Net:  
[<http://www.ctcnet.org/>]

Dave's ESL CafÈ: [<http://www.eslcafe.com/>]

E-mail Projects:  
[<http://www.otan.dni.us/webfarm/emailproject/email.htm>]

ESL Loop: [<http://www.linguistic-funland.com/esloop/>]

Helsinki University of Technology (HUT) Internet Writing Project: [<http://www.hut.fi/~rvilmi/Project/>]

Literacy Information and Communications System (LINCS),

National Institute for Literacy: [<http://novel.nifl.gov>]

Literacy List:

[<http://www2.wgbh.org/mbcweis/ltc/alri/LiteracyList.html>]

LitLink: [<http://www.pbs.org/learn/literacy/>]

Massachusetts Adult Literacy Technology Team (MALTT)  
statewide adult literacy and technology plan:  
[<http://www2.wgbh.org/mbcweis/ltc/alri/malttplan.html>]

National Center for Adult Literacy (NCAL):  
[<http://litserver.literacy.upenn.edu/>]

San Francisco CNN Stories for New Readers:  
[<http://www.cnsf.com/education/education.html>]

Teaching and Learning with Internet-Based Resources, a set  
of lesson plans and activities:  
[<http://novel.nifl.gov/susanc/inthome.htm>]

Texas Statewide Adult Literacy and Technology Plan  
[<http://www.ideal.swt.edu/interalt/>]

### **Television and Video Resources**

Connect with English: Annenberg/CPB Collection, P.O. Box  
2345, South Burlington, VT 05407-2345; (800) LEARNER  
(532-7637); go to [<http://www.learner.org>]; or visit Learner  
On-line.

Crossroads Café: For print materials contact Heinle &  
Heinle Publishers, Boston, Mass., or call (800) 553-6454.  
For information regarding video licensing or purchases,  
contact INTELECOM at (800) LRN-BY-TV.

GED on TV: Call Kentucky Educational Television at (800)  
354-9067 or write Enterprise Division, 560 Cooper Drive,  
Lexington, KY 40502.

### **References**

Bruner, J. (1986). Actual minds, possible worlds. Cambridge, MA:  
Harvard University Press.

Bruner, J. (1990). Acts of meaning. Cambridge, MA: Harvard University  
Press.

Cowles, S. K. (1997, September). Technology melts classroom walls. *Focus on Basics*, 11ñ13.

Hopey, C. E. (1998). Planning and funding for technology. In *Technology, basic skills, and adult education: getting ready and moving forward*. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education.

Kaku, M. (1997). *Visions: How science will revolutionize the 21st century*. New York: Doubleday, Anchor Books.

Papert, S. (1993). *The children's machine: Rethinking school in the age of the computer*. New York: Basic Books.

Piaget, J. (1973). *To understand is to invent*. New York: Grossman.

Resnick, L. B. (1989). Developing mathematical knowledge. *American Psychologist*, 44, 162ñ169.

Roberts, L. (1993). *Adult literacy and new technologies*. Washington, DC: Office of Technology Assessment, U.S. Congress.

Sabatini, J. (1997). *Instructional technology utilization survey of mid-western adult literacy programs*. Philadelphia: National Center on Adult Literacy, Graduate School of Education, University of Pennsylvania. See also an NCAL Brief at Literacy On-line: [<http://www.literacyonline.org/NCRTECSVY/ncrel1.html>].

Turner, T. (1998). Technology in adult education. In *Technology, basic skills, and adult education: getting ready and moving forward*. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

[Resources](#) ➔