

Literacy and Technology

Today, more than ever, people need strong literacy skills to keep pace with our increasingly complex world. In a "high-tech" information age there is a widening gap between the literacy we have, and the literacy we need, to meet new and higher demands on our skills.

In a world of fast-paced technological change, technology has a significant role to play in furthering the development of literacy. Learning technologies can expand access to the widest possible variety of learning experiences for adult learners. More than providing just an alternative learning method, learning technologies can provide more creative and powerful ways to learn.

To do this effectively, learning technologies need to be designed in consultation with learners and practitioners and in accordance with principles of good practice in literacy education. Partnerships between the technology and literacy communities can foster and develop: cooperative learning models that support interaction among learners and instructors, curricula that are relevant to learners' lives and lead to the development of critical thinking and problem-solving skills as well as language literacy, adaptations to a variety of learning styles and environments, technical training and support for literacy practitioners, and innovative ways to increase social access to technology for literacy learners.

Technology also has a significant role to play within the literacy field as a way to network, communicate, share information and resources, reduce isolation, and provide professional development and training for practitioners: *"An electronic infrastructure does for the literacy community what the railway did for this nation. It links scattered communities and maximizes opportunities to share resources and ideas".*¹

The use of learning technologies in the adult literacy field

We were interested in finding out what literacy practitioners think about the learning technologies they use in their programs and how these could be improved. We gathered information through interviews with literacy practitioners and a literature review. The first section describes desired features in instructional software, followed by a brief analysis of issues related to hardware, technical support and training, and access to technology in the literacy field.

¹ *Budget 1997: Implications for Literacy in Canada.* (Ottawa, Ont.: Human Resources Development Canada, National Literacy Secretariat, 1997), p. [10]

Desired features in instructional software

- **Authoring capabilities.** There needs to be more software with authoring capabilities, allowing instructors to generate their own materials to make learning relevant for their students and to incorporate students' prior knowledge. Software programs often do not capture the interests, nor represent the diverse cultural backgrounds, of adults in literacy programs.
- **Adult-oriented.** While there is a lot of educational software on the market, not enough of it caters to adult interests or relates directly to the context of adult learners' lives. Much literacy software is inappropriate for adults because it is intended for children and/or has childish images (e.g. "goblins and flowers"). There is a need for software programs that offer "real life" adult-oriented context and tasks.
- **Student control.** Giving students more control over the software is essential to an adult, learner-centered approach to literacy instruction. Students often feel frustrated when the computer controls their learning. Control includes being able to:
 - adjust the rate and sequence of information, review and repetition
 - flip through exercises to find the ones they like and exit the exercises they don't like
 - move onto more difficult exercises when they feel they are ready
 - select the level of text that they wish to work on by choosing their own skill level
 - override the timing function
 - access information about their performance at their own discretion
- **The level of reading required to use the software should be consistent with the level of the learning activities.** Written instructions provided in a program can be difficult to read. These instructions may require a higher level of reading ability than the software is teaching and often require "way too much reading for beginning level students."
- **Facilitate and support collaborative small group work among learners and learner-instructor interaction.** Most software programs are designed for independent use and don't provide interactive designs for learners to work collaboratively together in small groups. Also, instructional design must take into account the principle that computer-based instruction in literacy education is not intended to supplant the instructor. The instructor's role is key to the success of any instructional approach, whether or not the approach is based on computers.

- **Voice-activated software.** Voice-activated software is needed for students at all levels (beginning to grade 12) who, because of injury, lack of manual dexterity ("big, thick hands"), or diseases such as arthritis, are never going to be typists or successful in using a keyboard.
- **Audio components.** An accompanying audio component for all reading instruction software would give students more information to draw from and make learning to read easier.
- **Feedback.** Feedback should be fast, constant, and immediate, and provide good and appropriate reinforcement that is positive, adult-oriented, and constructive (not "boring or annoying"). Software packages are also enhanced when, instead of just giving feedback that the answer was correct or incorrect, the software actually shows the student the correct way of working through the problem.
- **CD-ROM material.** CD-ROMs are considered a "perfect format" for literacy students because there is lots of room for diagrams, pictures and illustrations and for large print, but, according to one college instructor, "it is an underused method of presenting material."
- **Canadian content.** There is a need for more programs with Canadian content. Programs tend to be American in content and language reflecting the high concentration of publishers located in the U.S.
- **Software evaluations.** Software evaluations are essential but time-consuming. There is a need to assist literacy practitioners in making purchasing decisions and to keep pace with the fast rate of production in new software.
- **Cost.** Most software designed for adult learners is too expensive for community-based literacy programs.
- **Specific types of desired activities:**
 - Basic math drills such as *Math Blaster* and grade-school level math for adults.
 - Math programs that "Drill at the basic level of whole numbers and fractions but don't have childish diagrams. It would be great if they also taught math concepts."
 - More voice-activated dictionaries such as the Oxford Picture Dictionary

- Multi-media spelling skill exercises
- More materials for reading and writing skills (such as Lectra)
- Programs for teaching English as a second or other language
- Adult-oriented, "real life" programs that incorporate real life tasks such as budgeting, career search, etc.

Hardware

- **State of the art equipment and connections.** These are needed to take full advantage of leading edge software and all the potential of the World Wide Web as an instructional tool. Community literacy programs often rely on donated equipment that doesn't prove useful because it is too old and out-of-date and even college programs often have trailing edge equipment lacking essential features such as CD-ROM drives and high speed processors. When computers respond slowly, students become frustrated and do not have positive learning experiences.

Training and technical support

- **Training and professional development for instructors.** Training to build the technical knowledge and skills of practitioners is an essential investment if we are to realize all the potential benefits of technology in literacy education. Training should include how to select and evaluate appropriate software for adult learners and how to integrate it effectively into programs.
- **Technical maintenance and upgrading.** Cost-effective methods of securing technical maintenance and upgrading are required. Few literacy practitioners have the kind of extensive technical knowledge required and few community-based literacy programs have the funding to hire technical staff at competitive rates.

Access

- **Access by programs.** Access to “state-of-the-art” technology is an issue for many literacy programs with limited funding. For many rural, remote and northern communities, where computer and information technology is still inaccessible, the issue is not “state-of-the-art” but rather the development of an electronic infrastructure that most southern communities take for granted.
- **Access by learners.** Access to computers and the Internet are important issues for literacy students. Studies show that computer ownership is related to income. A recent study in Ontario found that 80% of the instructors surveyed owned a personal computer, compared to only 30% of the students. Less than half of the students surveyed reporting using computers to access the Internet, compared to more than 80% of the instructors. Many students do not have a computer at home and rely on schools and libraries for access.

What literacy practitioners say about the use of technology in literacy education

“I can see more computers in our classrooms, I have no trouble with this. I just hope more software for adults gets written. You can wade through an awful lot of cutesy stuff searching for basic skills. The thing I see has the greatest potential is electronic networks in opening the sense of the whole world for students who never leave their hometown.”

“An interactive software program for curriculum development - where we could provide the content and the software gives us the format - would be wonderful. We are always looking for resources with content that truly captures the interest of our students.”

“Software evaluations are essential but time-consuming. It often feels like I am looking for a needle in a haystack to find appropriate software that is affordable.”

“How do we balance (or integrate) the computer literacy objectives that we all agree are useful in today’s society with language literacy objectives? Which one takes precedence? Do you choose a computer objective and then select a literacy objective that goes along with it or do you start with a literacy objective?”

“We need fast computers to support programs - students get really frustrated waiting for things to load - they start punching buttons and of course get nowhere. These students should have the best of all computers, not end of the line stuff.”

“Using the Internet is great with students who experience keyboarding problems because they can point and click and it is often filled with pictures and even sound and movies. However it does require state of the art equipment and connections to take full advantage of all these features. How do we fund this?”

“We won’t be able to find innovative ways to use technology until we are using it ourselves. A substantial investment in teacher training is required. I suspect that the number of literacy instructors with this skill set is small. As well, technology is constantly changing and staying abreast of trends and changes may be more difficult. Do literacy programs have enough funding to hire people to oversee this aspect or enough time to coordinate and recruit volunteers from the technology field? How many instructors are pulling double duty by providing this level of technical support while providing instruction to students along with a myriad of other responsibilities?”

"If you start anywhere, it should be with a good word processing program, followed by other adult-oriented software, such as a database program, etc. Our students are adults, and learning to use the computer as a tool encourages them to acquire more technology-related skills, and the necessary language skills which follow. With sufficient money and equipment, of course, there are lots of good literacy packages out there, such as the SUCCESSMAKER program, and a multitude of Web resources. But adults can get very tired of the repetition in canned programs and games fairly quickly. Obviously, the computer should serve as a tool for learning, just as you teach reading, writing and life skills in the classroom. It should stimulate learning and ideas, and have real life applications, but some of the real learning should also take place in the real world."

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Appendix

Use of technology in the adult literacy field

There are four mediums for computer-based activities in adult literacy:

1. Stand-alone systems using educational or word processing software
2. Integrated learning systems
3. The web
4. Email and conferencing software and platforms

1. **Stand-alone systems** using educational and/or word processing software for instructional purposes include activities such as:
 - drill and practice
 - tutorials
 - simulations
 - games
 - problem solving
 - reference
 - authoring tools
 - word processing and other computer applications

Examples of software programs used in literacy education include programs such as:

- All the Right Type
- Canadian Encyclopedia Plus
- Encarta Encyclopedia
- Grammaire
- Grammar Gremlin
- Grollier Encyclopedia
- Lectra
- Math Blaster
- Mathematics Worksheet Factory Deluxe
- Mathematique
- Microsoft Word and Corel WordPerfect and computer applications such as Excel
- Net Cards
- Netquiz 1.5

- Perfect Copy
- Speech Assisted Reading and Writing Program (SARAW)
- Spell It (Plus or Deluxe)
- Star 1020/Star 2010
- Starspell 2001
- Typing Tutor

See the attached list of software reviews from *On the Margins: Creating Opportunities for Learning with Computer Technology for Homeless People*.

2. **Integrated learning systems** (Hardware/software systems that offer instructional materials under the umbrella of a management system that monitors and reports on student performance. Most ILS's run on networked computers comprised of a file server and student workstations.)

- Autoskill
- Computer Curriculum Corporation (CCC)
- Jostens INVEST
- Principle of the Alphabet Literacy System (PALS)
- Programmed Logic for Automatic Teaching Operations (PLATO)

3. The **web** is increasingly being used to support instructional activities in literacy education. Two examples of recent initiatives are:

- "GED Online": The College of the Rockies offers GED-level Math and Writing Skills over the Internet using WebCT as a platform.
- "AlphaRoute": AlphaPlus, the Ontario literacy resource centre, has developed a new set of tools to support adult literacy on the Internet that includes reading, writing and math activities. Web site is: <http://alphaplus.ca/alpharoute/demo/>

4. For the past several years the literacy community in Canada has been developing **electronic networks and conferencing services** that provide new opportunities for communication, networking, and professional development within the field.
 - The western provinces and territories use FirstClass email and conferencing software as the platform for their on-line literacy communities.
 - Ontario's system, AlphaCom, is currently based on the web at:
<http://alphaplus.ca/talkto.htm>

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