

Computers in Classrooms: Essential Learning Tool . . . Or Program for Disaster?

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Jennifer was only seven when she started pestering her parents for a computer of her own. Her Grade 2 teacher had told her to ask her parents for one because all but three of the other children in her class were using home computers to complete their school projects. Jennifer's teacher believed that it was important for students to become comfortable with this technology and the sooner the better.

Teachers like Jennifer's are one reason sales of computers and software are booming. Between 1991 and 1992, sales of educational software jumped 50 percent. In the past three years, British Columbia schools spent \$35 million on computers, and Ontario schools spent \$140 million.

Ottawa and the other provinces have invested hundreds of millions more, and former Ontario Premier Bob Rae pledged \$500 million for computers in schools over the next five years. And then there's the \$475 million Canadians spent last year on video games—many people are under the impression the games have educational merit.

But not everyone is convinced that computers are effective learning tools. A growing number of parents and teachers are questioning the value of devoting so much scarce money and teacher time to a technology that is largely experimental. Some educators argue that most so-called educational software isn't good enough to introduce into the classroom.

"There is this idea that decent educational software is out there," says American learning theorist Roger Schank. "It isn't. The software you are seeing is a bad imitation of books. It's a good imitation of quizzes, but who wants quizzes as a form of instruction?"

Schank says the quality of most programs is poor because they have been designed by computer scientists who know nothing about how children really learn. As a result, they make programs Schank characterizes as "shoot the verb when it goes by."

Susan Kiil, a Toronto ecology consultant and author of several books on ecology for children, agrees. "Children are limited, not only by the parameters of the software but also by the creativity of the person who designed it," Kiil says.

Bad Imitation of Books

Because much educational software involves fill-in-the-blank or drill-and-rote work, Kiil believes we may be creating a generation of vertical, not lateral, thinkers. At the same time, she is concerned that using this technology in the primary years subtly devalues a child's own handwriting and drawing. Not only does the computer create a homogenizing effect because every piece of work looks the same but also children are left with a feeling that work produced by hand is less worthy than work that comes from a machine. In the long run, she says, we could be creating kids with self-esteem problems.

"Children are first and foremost creatures of sense," says Roma Lupenec, a special education teacher and parent of a four-year-old.

Children are attracted to computers because of the strong visuals and the mechanical aspect of playing with the keyboard. But ultimately the computer is a one-sense experience. Real learning, she says, nourishes the child's imagination by engaging all the senses.

Lupenec is particularly sceptical of software programs that claim to teach eye-hand coordination. One example she cites is a game that simulates a handball court. But because young children don't play handball and are unlikely to have visited a court, the game has little meaning for them. Artistic activities, like painting, yarn work, cutting or sewing, are far more effective in teaching eye-hand coordination than any computer game.

"It is much healthier for a child to be standing using an art easel," Lupenec says, "than to be sitting almost motionless at a monitor."

Most progressive educators agree that early learning experiences should be child-centred and concrete, using examples drawn from a child's experience and appropriate to his or her level of development. To develop skill with numbers, for instance, children should first be given concrete objects like blocks or pebbles to play with.

Learning should always proceed from the concrete to the theoretical, says Valdemar Setzer, a math teacher and computer science lecturer. Computers, says Setzer in his book *Computers in Education*, force a child to work backward, moving from the abstract to the concrete.

For this reason, he is also highly critical of computer geography programs. The best way to teach geography, he believes, is by personal recognition—explore and describe the neighborhood surrounding the school before moving on to the complexities of map reading. Setzer believes that the best time to introduce computers into classrooms is when students are in high school and more capable of abstract thinking.

But if, as some proponents argue, computers can speed up the learning process by teaching children to read, write or do basic arithmetic more quickly, shouldn't they have access to them as early as possible?

Not necessarily. Pushing children into an activity too soon may force them to use a part of their brain that was meant for another function and can actually interfere with the learning process, says American psychologist Jane Healy.

Children's minds are already bombarded with too much fast-paced sensory stimulation from electronic sources, Healy argues. In her book *Endangered Minds: Why Children Don't Think, and What We Can Do About It*, Healy says that too much electronic stimulation may actually be changing the structure of children's brains.

Bombard a Child

Television, computers and video games bombard a child with visual information, and do not leave enough time for quiet reflection, concentration or conversation. These quiet moments are essential, she says, if children are to develop into thoughtful people with the inner control necessary to manage their own lives.

Healy believes that electronic overstimulation, especially from computers and televisions, may be contributing to the rise in the incidence of learning disabilities, such as auditory-processing problems and attention deficit disorder. Children who are not taught to listen can easily develop habits that let them avoid exercising—and thus building—important auditory-processing connections in the brain.

"This very act of remembering lays down physical tracks in the brain, but children can quite easily avoid having to build these systems," she says.

Because some children now get more information from pictures than from talking, Healy argues that

their brains are simply not trained to understand and retain language. She points out that teachers believe that the listening skills of children in schools today are much worse than those of previous generations.

Like Healy, Susan Kiil believes that computers spell trouble for children who are not visual learners. Furthermore, the pressure to embrace computer technology in the school system is siphoning funds from other areas, such as the creative arts, which are critical to the development of the whole child. Music, for instance, is known to have beneficial effects on math as well as literacy skills. Not only does the ability to play an instrument bring children joy and a sense of accomplishment but also it allows them to develop focus and discipline. Yet many school boards have cut back or eliminated music programs, only to spend money on computers. Kiil also fears that widespread use of technology is devaluing the creative teacher as well as the child.

Proponents of computer technology cite studies that seem to show that it can improve writing and arithmetic skills, sharpen critical thinking and motivate children who want to learn. However, critics have taken issue with these studies, which are often initiated by the companies that market the software.

When Henry Jay Becker of Johns Hopkins University analyzed the results of computer evaluation reports from elementary and middle grades, he concluded that some studies substantially overreported the effectiveness of computers.

"The poor quality of most evaluations, and the likely bias in what does get reported, all provide too weak a platform for district purchasing decisions," he concluded in an article in the 1992 *Journal of Educational Computing Research*.

More recently, a Japanese study explained the effectiveness of using microcomputers in teaching on a sample of 803 primary school children. The researchers concluded that computer use neither improved intellectual activities, such as creativity, nor motivated the Grades 1 and 2 children to study more. A 1994 American study designed to test the effectiveness of computer-based geography programs showed that students who used computers learned no more than their counterparts who used maps and atlases.

Susan Kiil worries that children who are given computers too early will grow up without an essential critical perspective on the very technologies they're using. If we want children to have an appreciation of the natural world and their place in it, we should give them more opportunities to experience this world, through regular field trips that take them out of the classroom. If the educational system persists in leaning so heavily on technology, she thinks

we are in danger of losing the knowledge of how to use other, more imaginative technologies that may be more beneficial in teaching and learning.

Oh, and what about seven-year-old Jennifer, whose parents were told she needed a computer because all the other students had one?

Jennifer's mother went for advice to her sister, Charlene Watson, who is an office manager for a software developer. Watson knows enough about

computers not to be impressed and advised her sister not to buy a computer the family couldn't afford and didn't need.

"Grade 2 is just too young to be using this technology," she said.

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Smile

A smile costs nothing but gives much. It enriches those who receive without making poorer those who give. It takes but a moment, but the memory of it sometimes lasts forever. None is so rich or mighty that he can get along without it, and none is so poor but that he can be made rich by it.

A smile creates happiness in the home, fosters goodwill in business and is the countersign of friendship. It brings rest to the weary, cheer to the discouraged, sunshine to the sad and is nature's best antidote for trouble. Yet it cannot be bought, begged, borrowed or stolen, for it is something that is of no value to anyone until it is given away.

Some people are too tired to give you a smile, so give them one of yours, as none needs a smile so much as the person who has no more to give.