Computer Literacy: Time for a New Direction (Guest Editorial)


Many school districts across the United States are spending large sums of money to make their students computer literate. But much of this effort, while well intentioned, needs to be redirected.

While it is difficult to define precisely what a computer-literate student needs to know, the approach that seems to have gained the widest following may be termed the segregation approach. Under this approach students are made computer literate through a separate computer literacy course, often in the seventh or eighth grade. While the contents of these courses differ somewhat, there are some common elements. The typical computer literacy course contains introductions to programming, terminology, history of computing, social issues, binary arithmetic, etc.

Many examples of this trend exist. In 1983 the governor of Tennessee called for increased expenditures on computer education, with the eventual goal of placing at least one microcomputer and a teacher trained to use it in every school in Tennessee. By the 1985-'86 school year, every seventh and eighth grader in the state will have to take a course in computer literacy.

Other places with ambitious computer literacy programs include Florida, Texas, and Boston.

The time has come to analyze the reasons these expenditures are being made. Why should we, as educators, be so concerned with making students computer literate? Some of the reasons commonly given are the following:

**To Help America Maintain Its Position of Technological Leadership**

To do this will require large numbers of highly skilled scientists and technicians. Our schools are widely viewed as failing to produce enough of them. *A Nation at Risk* (1983) details the scope of the problem as perceived by the political, industrial, and educational leaders of the country. Students, it is believed, do not work as hard as they did 20 years ago, and do not get as much homework. When compared with students from other countries, American children come out at or near the bottom in most academic areas.

These deficiencies are seen as a threat to America's pre-eminent position in the emerging high tech industries. Japan, for instance, with half the population of the United States, produces more engineers. One response of educators to the charges that our schools are too lax has been to develop separate courses in computer literacy.

But *A Nation at Risk* calls for something far more rigorous than computer literacy. It recommends that every high school student be required to take a course in computer science, much as they now take biology and algebra. In the long run, this computer science requirement is seen as a much stronger response to the Japanese challenge.
To Prepare Students for the Jobs of the Future

It has been estimated that by the year 2000, 90 percent of all jobs will require computer skills. It is natural for parents and educators to be concerned with these changes and to want to prepare today's students for these jobs. Studying computer literacy is seen as one of many steps in the right direction. But how is studying computer literacy going to help a teenager get a job?

The latest Department of Labor projections reveal that the greatest number of jobs created between now and the turn of the century will be decidedly low-tech in nature, with fast-food employment and custodial services leading the way. Of the 20 leading areas of projected job growth, not one could be classified as requiring computer training, so it is not readily apparent how the study of computer literacy will help students prepare for these jobs. Will it be necessary to study about Ada Lovelace and CPUs in order to work for McDonald's?

The computer-related jobs that will expand in number require far more computer knowledge than can be offered in a computer literacy course required of every student. To prepare people for these jobs, schools need to train as many students as possible in mathematics, the natural sciences, and computer science. More rigor is needed.

To Make Students Better Problem Solvers

Computers are seen as great aids in making students more proficient problem solvers. For example some educators, including most authors of computer literacy texts, seem to believe that if all students were exposed to programming, their problem solving skills would improve greatly. In addition, many software packages promise to improve children's problem solving abilities.

The major problem with these claims is that there is no proof that exposure to programming or a particular software package or computers in general makes students better problem solvers. Does it make sense to rely too heavily on programming and problem solving programs to make students better problem solvers in the absence of supporting research?

Each of these three reasons is a worthy goal of education; at first glance it is difficult to oppose any of them. But as rationales for teaching computer literacy, each has serious shortcomings.

With these obvious weaknesses, how has the segregation approach gained such wide acceptance? For one thing, it is easy to implement. Only one or two teachers per school need to learn enough about computers to take an entire student body through a separate one-semester computer literacy course. Another advantage is that there will be less disturbance of the status quo (always the easier route in a bureaucracy); the routines of fewer teachers are disturbed.

Integration: An Alternative

Despite these pluses, a more desirable approach to computer literacy may be an integration approach, under which computer use is merged into all areas of the curriculum. To implement such a program, attention must be focused on making teachers computer literate, defined as able to use computers at a state-of-the-art level to help teach their fields of specialization. Under integration, it becomes the professional responsibility of every teacher, not just the computer literacy teacher, to gain knowledge of the educational applications of computers.

Teaching is fast becoming a profession in which computers can no longer be ignored by practitioners who wish to remain up to date. Society expects its professionals to stay abreast of
the latest changes in their fields, and teachers should be provided with the financial and educational support needed to meet these expectations.

If for no other reason, teachers need to know about computers because the bodies of knowledge they are expected to impart to their students are being altered by computers. Almost every academic discipline—business, science, mathematics, journalism, and social science, to name a few—is being reshaped by computers. Today it can be argued that, to know a subject well enough to teach it, an educator must know how computers are used in that field.

Take, for example, the teaching of English. At a bare minimum, English teachers should be familiar with word processing, grammar drill and practice software, and SAT review software. Once familiarity is gained with, say, a word processor, the teacher, as a professional, can decide whether or not to use it with students. But before this decision can be made, the teacher must first know how to use a word processing program. Until then, any decision regarding word processing will be based more upon prejudice than knowledge. The English teacher, in short, must become computer literate. Other subjects will require different computer skills, but all will require some.

Seen from this perspective, it becomes the professional responsibility of educators to learn how computers are altering their fields of specialization, to analyze these changes, and to develop ways to incorporate these changes into their classrooms, if doing so is judged by educators to have sufficient educational value to justify changing the curriculum. For their part, school boards and universities have the responsibility of providing teachers with the necessary training and equipment to become computer literate.

The integration approach is not as easy to implement as segregation. It requires far more staff training and much greater expenditures for hardware and software. But it has the potential to be much more effective. Not only will educators become computer literate, but students will learn that computers are far too important to be segregated into their own separate compartment in the curriculum. In short, they will learn that computers are applicable to the entire realm of learning.

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