

EDITORIAL/OPINION

Computerizing the Classroom

By STEVE CHARNOVITZ

As school bells ring across the country, it is an appropriate time to reflect upon the plight of American education.

Despite considerable high-level attention over the past decade, our schools continue to suffer a double-edged problem. In comparison to students in other advanced countries, American students don't learn as much. To add insult to injury, this low quality education costs U.S. taxpayers more per student than is paid in any other country except Switzerland.

Several years ago, economist William J. Baumol explained why many personal services, such as performing arts and teaching, are subject to a "cost disease" of rising expenses. While many sectors, such as manufacturing, can lower their costs by using fewer hours of labor input, other sectors cannot.

It takes the same number of musicians to produce a symphony today as it did 200 years ago. It takes approximately the same number of teachers to lead a class now as it did a generation ago. Since we do not want to freeze wages of musicians and teachers, their cost will rise in real terms.

Happily, a technical solution exists to the problems of low quality and stagnant productivity in teaching. That solution is to use the personal computer as a teaching tool. Just as the computer has transformed many fields like design, accounting, sales, etc., it can transform primary and secondary education.

Computers have been used in schools for more than a decade. But so far the pedagogical results have been meager. There are several reasons for this failure. One is that there aren't enough computers in the classroom. The current student to computer ratio is about 14-to-1. That is far too high. Even worse, many of the available computers are outdated or user-unfriendly.

Another handicap is inadequate and unimaginative software. All too often, grade schools use computers mainly for games. Still another difficulty is that teachers get little training in how to maximize the instructional benefits of a PC.

The availability of inexpensive personal and laptop computers provides one answer to the dual problems of educational quality and cost. By tailoring instruction to the learning ability of individual students, schools can boost academic performance. By making teachers more productive, society can control the "cost disease."

Right now, many schools aim to teach only "computer literacy" or "programming" in special computer labs. Instead, computers should be fully integrated into every classroom. PCs should be viewed as a tool — just like a textbook, a blackboard or a pencil. The proper student to computer ratio is 1-to-1.

Each schoolchild should consider that computer as his or her own personal learning machine. At upper grades, students should be able to use their computer notebooks for homework.

The most significant barrier in computerizing the classroom is the lack of good academic software. A wide variety of user-friendly programs is needed to match each grade level. The software should also be highly interactive so that inquisitive minds can jump to related issues.

Operating public schools is a state and local responsibility, not a federal one. Nevertheless, the federal government could take a few steps to promote computerization in schools.

One idea is to motivate software developers to create better "kidware" for the educational market. The U.S. Department of Education could establish a national competi-

tion to create new software for teaching math, reading, spelling, writing and science. A \$1 million prize for the best programs in each subject would stimulate interest.

As Alexander Hamilton pointed out two centuries ago, public prizes (he calls them "premiums") can be "both honorary and lucrative," and "a very economical means of exciting the enterprise of a whole community."

To assist in the purchase of computers, the government might establish a matching grant to school districts based on their median income levels. Poorer school districts would get more help in paying for new hardware.

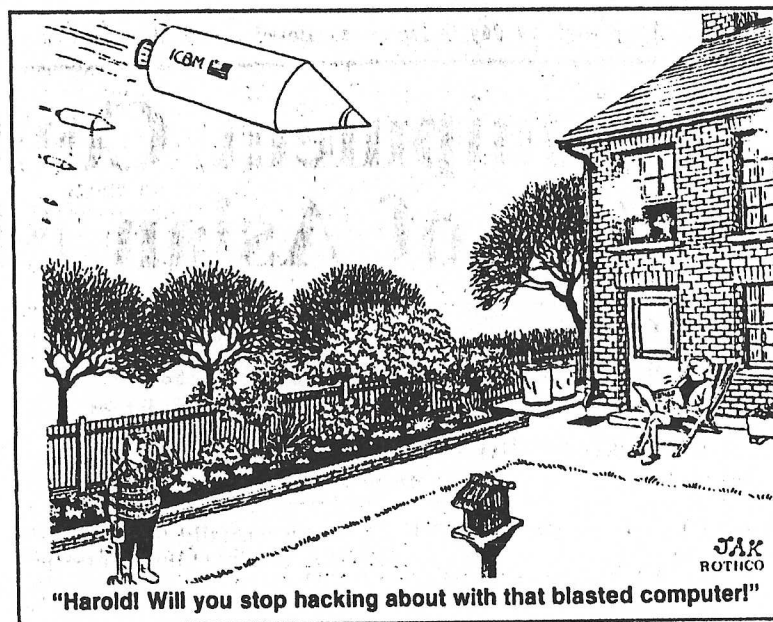
The initial costs will be high, since in addition to purchasing computers, many schools will have to redo electrical wiring and add outlets for modems. Only 2% of American classrooms are now equipped with a telephone jack.

The logistics of purchasing such a large number of computers will take some time to work out. The monitors should be built into desks and the keyboards should be uncomplicated. This would be a great opportunity to cease using the inefficient QWERTY keyboard.

Obviously, the personal computer is not a panacea for all the troubles of our schools. But it could make learning more exciting and demystify the computer at an early age.

An ambitious federal-state effort might aim to put a computer and good software on every third grader's desk by September 1996. If designed wisely, such an initiative could enable American schools to make a giant leap in quality. Indeed, it could become the most significant federal assistance to students since the National School Lunch Act of 1946.

Steve Charnovitz writes on trade and competitiveness issues from Washington.



"Harold! Will you stop hacking about with that blasted computer!"