A Sneaky Way to Improve Education


It is with considerable pleasure and satisfaction that I begin this new editorial year. The exciting merger of IACE and ICCE brings new energy and direction to the ISTE staff, board, committees, and other volunteers. Meanwhile, many new computer hardware, software, and supportive instructional products have come to market. Teachers are learning more about computers. The amount of computer facility available to students is growing. I feel that 1989-90 will be a good year for the field of computers in education.

I spend a lot of time thinking about use of computers in schools. I keep looking for "the" answer that will quickly and painlessly transform our schools. The goal is to improve education-to help children reach their full educational potential, and to help prepare them for life in our information age society.

I often run into people who think they know "the" answer. Some suggest that the answer lies in more hardware. If we just had enough computers, then education would be better. If one computer per twenty students isn't enough, how about one computer per ten students? If one computer per ten students isn't enough, how about one computer per five students?

But we now have quite a few sites where this ratio has been reached and exceeded. Unfortunately, I am not aware of over whelming evidence that this has made education better at these sites.

Other people suggest that "the" answer lies elsewhere. Perhaps it lies in better software tools, such as databases, graphics, and word processors. Perhaps it lies in better computer-assisted instruction. Perhaps it lies in having more powerful, more user-friendly computer systems. Perhaps it lies in better instructional materials to support instructional use of computers. All of these seem important. But once again, the research evidence has not emerged at a convincing level. For years I have held to the position that "the" answer lies in staff development. How can we expect computers to have a significant impact on schools when the typical computer-using teacher has had such a small amount of training and experience in this area? We must empower teachers by providing them" with their own personal computers and providing them with a large amount of carefully designed and carefully presented inservice.

I haven't given up on this approach. I am firmly committed to empowering teachers. They are certainly a key component in our educational system. And after all, much of the progress we have made so far has been at a grass roots movement. Many thousands of individual teachers have put in the time and energy to learn to make effective use of computers in schools. They are doing good things-and their numbers are growing.

But in recent years I have begun to think that I have found an even better answer. It is a simple but somewhat sneaky answer. It is based on the idea that one of the major goals of education is to help students to get better at problem solving. (People also talk about higher-order skills, critical thinking, and so on. Here I am lumping all of these terms together with problem solving.)
The answer is: Empower students. Enlist them in improving their own education. Help students to learn that it is to their advantage to get better at solving problems. Teach them to challenge teachers who are not teaching problem solving. Most especially, teach them to challenge teachers who are having their students learn by-hand methods to do things that a computer can do very well. Computers are important because they are an aid to the human mind in problem solving. They can solve or help solve many of the problems that humans have learned to solve. Unfortunately, our current school curriculum doesn't place enough emphasis on problem solving. Few students are given relatively explicit instruction in what is known about problem solving or how to get better at it. They are not taught the power of their own mind and how to use tools such as the computer to supplement their mental power.

Here are a few recommendations I make to students:

1. Gain increased understanding of your own mind. Learn about metacognition—thinking about thinking. Practice extensively in thinking about your own thinking process as you work to solve problems.

2. Learn to learn. Learn effective learning habits—what works best for you. As you learn, think about the learning process and how to get better at learning.

3. Learn about good and poor thinking habits. Identify your own good and poor thinking habits. Explicitly and consciously practice good thinking habits.

4. In each subject you study, gain an explicit understanding of what types of problems the subject covers, what is known about solving these problems, and what is not known. Think about what you want to store in your head about solving these problems. Think about other aids to solving these problems, such as making use of reference books. Learn the capabilities and limitations of computers as an aid to solving the problems of the subject. Learn to use the computer in situations where it is an effective aid to problem solving.

5. Challenge your teachers who do not teach problem solving and who do not seem willing to let their students know that computers are a useful aid to problem solving. But do this in a gentle and professional way.

Every teacher is capable of helping students to get better at problem solving. There is a very easy way to do this. First, directly address the issues given in the above list. Work to empower students. Second, test for problem solving. Research strongly supports that testing is critical. If teachers give tests emphasizing problem solving, students will get better at problem solving. The goal is to have students be more fully aware of their own minds, how to improve the functioning of their minds, and how to make effective use of aids to their minds. I want students to challenge and question their teachers. I want students to take increased responsibility for their own educational progress. I want to empower students!