The Future of Information Technology in Education


I have recently finished writing a book about the future of information technology (IT) in education (Moursund, 1997). In this book, I argue that the educational impact that IT has had so far is small compared to what the next 20 years will bring.

Rapidly Increasing Technological Progress

Continued rapid improvements in IT hardware will lead the way. For example, consider the following quote describing a memory chip being developed by a Japanese company.

NEC is developing a 4-GB memory chip; it will store 47 minutes of full-motion video, or 256 times the capacity of the 16-MB DRAM chip now commonly used. NEC says it will begin selling the chip around 2000 (Pollack, 1997, p. D5).

We all know that steady improvements in transistor technology are leading to faster and faster microprocessors. By the year 2000, the GHz (one billion operations per second) microcomputer will be available. The following quote looks still further into the future.

Intel chief operating officer Craig Barrett says that the technology now found in $50,000–$75,000 workstations of the kind capable of producing images such as found in the film “Jurassic Park” will be available in $2,000 PCs in just a few years. He also predicts that PCs in the year 2011 will use a billion-transistor chip, compared with about 8 million in the most advanced chip today (“Intel,” 1997, p. D2).

Similar rapid strides are occurring in communications technology, as the following quote illustrates.

Three separate groups of researchers have succeeded for the first time in transmitting information at a rate of one trillion bits per second—a terabit—through an optical cable. Fujitsu, Nippon Telephone and Telegraph, and a team from AT&T Research and Lucent Technologies reached the terabit threshold four years earlier than expected (Association for Computing Machinery, 1995, p.11)

This bandwidth is about 400 times the bandwidth of the optical fibers currently in commercial use.

My analysis of information from many different sources suggests that total worldwide computing power and worldwide bandwidth will each grow by a factor of at least 500 in the next 20 years. It is certainly reasonable to speculate that similar amounts of change [in computing power and connectivity] may occur in our educational system. The scenario that follows is based on a conservative estimate of a factor of increase of “only” 100 during the next 20 years. This is a compound rate of change of slightly greater than 25% per year.

A Scenario

Take a look at your own school—the amount of computing power in the school and the nature and amount of connectivity. Now, consider each increasing by a factor of 100. If your school is “average” compared to current schools in the United States, this level of increase would
provide each student with a microcomputer that is at least 10 times as powerful as today’s midpriced machine. It would provide every student with connectivity to worldwide and local area networks at a bandwidth that supports high-quality interactive video.

Consider a scenario 20 years in the future: Every student has a personal portable microcomputer for use at home and at school. Wireless connectivity to local and worldwide networks is provided in every classroom. A wide range of software tools and educational software is available to every student. Computer-assisted learning and distance education are routine parts of the teaching and learning environment, both at school and at home. These methods of instructional delivery provide access to instruction in the full range of coursework that is appropriate to K–12 students. The combined power of current hardware and software supports high-quality voice-input systems. Tool and educational software are both “intelligent”—that is, they reflect the steady progress that has been occurring in artificial intelligence.

The market forces in IT are driving the technological changes that make this scenario plausible. These forces are driving the development of more powerful computers, increased bandwidth of networks, and increased connectivity. Such progress will occur independently of whether the facilities are made available to students in any particular school or school district.

Similarly, computer-assisted learning and distance education are also driven by market forces. These aids to teaching and learning will continue to improve and will become more available, independently of choices made by individual schools or school districts. The home market will be one of these driving forces.

Personal Implications

Such scenarios that speculate about the future are useful in considering the present. Suppose that the scenario is an accurate prediction of what many schools will look like 20 years from now. What do you, personally, intend to do about it? What are the main thrusts of your professional interests in IT? For example, are you interested in the acquisition and maintenance of hardware, software, and connectivity, as well as technical support for end users? Or are you more interested in professional development—that is, helping all teachers learn to use IT effectively? Do you want to be involved in curriculum development and assessment—integrating routine use of IT throughout the curriculum? Or, do you hope to be a high-level leader—one who facilitates large numbers of people working to accomplish the previously mentioned tasks? (There are now a small but growing number of assistant superintendents for IT.)

Whatever your answer, you face the challenge of continuing rapid change. You need to develop a network of people and sources of information that can help you meet these challenges. The International Society for Technology in Education (ISTE) can be one part of the help that you seek. It is a source of high-quality information as well as a vehicle for getting connected with people like yourself. And, ISTE’s publications can help you to stay abreast of your professional field.

References

