
Implications of Computerized Education

by
Russell Sawchuk

*Acting Coordinator for Research and Planning
Grant MacEwan Community College*

*President
Alberta Society for Computers in Education*

As an educational planner, I have ample opportunity (indeed I am forced) to analyze trends in society and ascertain what implications, if any, they will have on the educational system. I am convinced that the microprocessor revolution will have more impact on the way we live and work than any development since the industrial revolution. The educational system, designed to prepare our youth for useful and productive roles in society, will be significantly affected.

Another important lesson I have learned in my short tenure as a planner is that there are often unforeseen, but major, unpredictable ramifications in these technological developments. Therefore, rather than talking about the visible topics of hardware, software, and courseware, I would like to reflect on some of the potential issues which may arise in education as a result of the proliferation of the computer.

Basic Skills

I find it extremely ironic that although a computer can retrieve and

process data in millionths of a second, the rate the information is transmitted to an individual is dependent on his reading speed. The man-computer interface is predominately the printed word. Therefore, no matter how efficient the processors become, the key factor in utilization becomes how well a person can read. Thus, I expect an increased demand will be made on our educational systems to teach individuals how to read quickly and effectively. Basic reading skills will become increasingly important.

Data banks always have limited storage capacity. Therefore, the information stored in them must be written in a concise and precise manner. I believe that the technological revolution will have an impact on the written language. Short, clear, and concise writing will be encouraged to ensure maximum storage capability and easy reader use. Even words and language structure may be altered to meet the needs of economy and efficiency. Eventually this language will find its way into everyday speech. The educational system will be required to teach these basic writing skills.

Like writing, math will be taught in a different manner. With computers and calculators, computational skills become less important. However, with the greater access of mathematical tools, greater emphasis will be needed on application and interpretation. In fact, learning how to use math in decision making will become an integral part of the basic educational system.

One of the more interesting side benefits I have observed in teaching computer courses is that working with computers improves the logical reasoning and analytical skills of students. It will become necessary for schools to teach students rigorous, disciplined reasoning and problem-solving skills. I suspect that the emphasis will swing from the "creative" to the "disciplined" in order to enable students to cope with the new technology.

I cannot help wondering what effect the technology will have on interpersonal skills. Many of the activities done today involving people will soon be done by machines. Banking is one example in which the "Green Machine" is replacing the smiling teller. (In fact, a restaurant in Toronto has become totally computerized.) The machines are efficient, eternally patient, and do not mind being insulted. I am not sure whether the overall impact will be negative or positive, but it will probably be significant.

The Educator

I will not dwell on the role of the computer in the classroom. This has been sufficiently covered elsewhere. I will examine other implications for teachers.

First, a massive retraining and upgrading effort will be required to enable teachers to cope with and utilize the new technology. Unlike oth-

er educational fads, the computer cannot be ignored - it will not go away. The technology is so all-pervasive and encroaching that an educator ignores it at his own peril. Staff development for teachers will become more important than ever before.

The computer will have an impact on work loads. Teachers will be working differently with computers in their classrooms. This means some changes in contracts between teachers and their employers. I expect uncertainty and confusion for some time before this issue is resolved.

Related to the above issue is one of security. It is likely that many educators feel anxious and uncertain about the advent of computers. This is understandable and predictable. However, it means that unless these concerns are handled well, the result will be resistance, hostility, and other forms of dysfunctional behavior. There may also be an increase in turnover among teaching staff. Major technological change can have adverse and disruptive effects on the staff. One should expect considerable anxiety and disruption over the next few years until teachers accept and utilize the computer.

A final issue I would like to address is that of time and resources to develop course materials. Until such a period as adequate, educationally sound courseware is available, many educators will need to be encouraged to produce appropriate materials. Those of us who have been involved in this process know that it is very time consuming. Therefore, I expect that demands will be made by the educators for time, resources, and incentives to develop materials. This will cause further strains on the already limited resources of most systems.

The System

The computer revolution will cause many interesting problems and challenges for our educational system.

Difficulties will be encountered in the management and administration of the technology. Decisions will have to be made on a number of issues: where in the organization the technology fits in; who should be responsible for it; whether it should be centralized or decentralized; and other decisions. In addition, senior management will have to be educated as to the implications of computers.

Resource personnel will be required to assist educators effectively utilize the technology. A question arises as to the most appropriate qualifications of these consultants. Should they be computer specialists, content specialists with some knowledge of computers, or should they be specialists in both computers and their content area? Another concern is that there exists, and there is expected to continue to exist in the foreseeable future, a tremendous shortage of computer personnel.

With the advent of distributed processing and improved communication capabilities of all computers, the potential exists for developing centralized educational resource databanks. This would enable educators throughout the province to have access to and use of far greater materials than any individual system could afford. However, this also opens up nightmares of coordination, funding, jurisdictional disputes, capabilities, etc. The negotiations will be long and difficult and will likely delay the establishment of such resource centres.

One issue which has already raised its ugly head is a regulation known as the "seat time" rule. This

requires a student in the basic system to have so many classroom hours in a course prior to being permitted to advance to the next level. A similar problem may exist in credit courses at the post-secondary level. A problem develops when a student, using a CAI package, masters the material in less time than he would by traditional methods. This is cited as an example that there probably exist innumerable provincial regulations which are incompatible with the use of technology in the educational system. Changing these regulations will take time and effort.

Summary

The computer revolution is here! It will have a major impact on the educational system. The technology will affect the teaching of certain basic skills which will be required to cope with the changes: for example, reading, writing, math, and reasoning. The revolution will affect the educator. It will probably require considerable upgrading and staff development; it will affect staff workloads; it will require development and production of materials; and it will affect the mental well-being of staff. Some of the implications for the overall system include such things as: educating management, organizational changes, appropriateness of resource personnel, and development and maintenance of resource centres and provincial regulations.

It is often the unexpected consequences that cause the most problems. Certainly the introduction of computers into the educational system is happening quickly. It is hoped that by alerting the reader to some of the potential problems, the disruptions and obstacles can be minimized, and the computer can become an integral part of our educational system.