The Information Revolution in Education

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Just as the Industrial Revolution transformed the world two centuries ago, the Information Revolution will transform our lives in the next millennium. The challenge for us in education is to exploit the exciting possibilities that Information Technology offers to prepare our people for this information revolution. We need to provide an environment for students to use information effectively as well as to transform information into knowledge.

Perhaps the greatest impact for education is that technological developments have overcome the constraints of time and place, age and circumstance. In the past, people had to travel long distances to sit at the feet of great teachers to seek out knowledge. Great centres of learning grew up around monasteries and universities where precious manuscripts were hoarded in their libraries. The printing press changed that, bringing knowledge closer and making it more accessible to people. Mass education became possible.

Now information is available at the click of a mouse. It flows readily without regard for borders. Every teacher and every student can break out of the boundaries of his school and have access to great stores of knowledge all over the world. There is too much to learn, too much to know.

What is important now is to decide on the fundamental subject content and principles which a student needs to know, and upon which the acquisition of further knowledge is based. Beyond that, students need to be given the necessary tools and skills to access information, extract what is useful and relevant, and distill the information into useful knowledge. For schools, this means that we must develop in every child the capacity to handle information and to learn independently.

It is not just the quantity of information that has multiplied. Multi-media technology also provides the capability to present information in a number of new and interesting ways. Animations, visualizations and simulations offer engaging and participative ways of learning and understanding that make otherwise difficult or boring subjects suddenly come alive.

Information Technology also allows this active learning to take place beyond the physical boundaries of the school. It allows students to reach out to form collaborations with counterparts anywhere in the world. This brings an immediacy and authenticity to learning that would not otherwise be possible.

But it will not only be the young who will benefit from this Information Revolution in Education. Information Technology will also be a big factor in the next major frontier of education – mass continuing education. With rapid technological change, there will be a need for the whole workforce to continually upgrade and learn new skills and knowledge.

Information Technology will permit mass access to high quality courses delivered over broadband networks. This is particularly beneficial for mature students who have to juggle family commitments and work demands, including over-time and shift-work, while pursuing upgrading courses. Such worker-students will save travelling time and be able to flexibly tailor their own study schedule to pursue their courses from home or elsewhere at the times most convenient to them. These worker-students can log in to lectures whenever they want to via video-on-demand. They can take part in on-line tutorials and seminars. They can carry out coursework and collaborative projects with other students.

This year marks the beginning of the final phase in the implementation of Singapore’s IT Masterplan. Another 231 schools will come on stream in this final phase, adding to the 130 schools in the first two phases. At the end of this phase
which will last 2 years, all schools in Singapore will be equipped with an IT-enriched learning environment which will include whole-school networking, funds to buy software and on-line services, and a start-up pupil computer ratio of 6.6 to 1 for primary schools and 5 to 1 for secondary schools and junior colleges. Schools which are ready can go beyond this start-up ratio and achieve the target ratio of one computer for every 2 students by the year 2002.

More significantly, 13,500 teachers will be trained in the pedagogical aspects of using Information Technology in the classroom. When they have completed their training, they will join their 9,500 colleagues who were trained in the last two years. All teachers in our schools will by then have between 30 and 50 hours of such training. They are the ones who will use the technology with their students and make it meaningful for student learning.

Information Technology has added another dimension to leadership roles in education – the management of change. The integration of technology into the curriculum is very much about change. Principals are key leaders in creating a shared vision and setting strategic directions for systematic change. The key to the success of technology integration is people. Principals as school reform leaders will have to nurture their staff and provide a system that is supportive of learning and change, for example, through organizing professional sharing sessions and seminars.

We have learned much after 2 years of implementing the Masterplan. The initial signs are encouraging. All our schools have multiple Internet access points, and broadband access via Singapore One. Many have established linkages with schools in other parts of the world, including those in Southeast Asia. Our students are beginning to make their mark in cyberspace and have done well in international website design competitions such as Thinkquest.

Our teachers are also more confident and competent in the use of Information Technology, coming up with many new and innovative ideas. They have also shared their best practices with other teachers in a series of Information Technology in Education Seminars organized throughout the year.

The wide scale implementation of the Masterplan has also provided many opportunities for industry and Information Technology organizations to work collaboratively with schools to introduce new technologies and ideas for teaching, learning and educational administration. The Ministry is also working with local multimedia companies to produce education software for our schools. An exciting future awaits students and teachers as they explore the opportunities opened up by information technology.