

INFORMATION TECHNOLOGY IN EDUCATION

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Singapore is a cosmopolitan place. The planning of the city has been very systematic; the roads are wide, with trees and flowers planted all along them. The city is clean and tidy as well. Deservedly, Singapore has the fine reputation of "Garden City" and "Sanitary Model of South East Asia". Moreover, Singapore is not only famous for its cleanliness, but it is also a city of high technology. This may be the result of the prevailing teaching and learning of IT skills in education and the promoting of the use of IT by the Government. Four secondary schools, Dunman Secondary School, Anglican High School, Manjusri Secondary School and Serangoon Secondary School, were visited. Our group was expected to explore their strengths and distinguished features regarding the implementation of IT education.

Government's Policy & Schools' Strategies

The Singapore Government launched a five-year IT Master Plan in 1997 (one year earlier than Hong Kong). The Government selects schools to join the plan in different phases and these schools aim to have teaching in at least 30% (25% in Hong Kong) of the curriculum supported by IT. Usually, selected schools have their own strategies to achieve the aims, stage by stage. It is similar to the current practice in Hong Kong. The year of joining the IT Master Plan, the strategies set and the current achievements of the four visited schools are summarized in the following table.

	Dunman	Anglican High	Manjusri	Serangoon
Year (Phase) joined the IT Plan	1998 (Phase 2)	1997 (Phase 1)	1999 (Phase 3)	1997 (Phase 1)
School strategy (% of curriculum using IT)	1 st year: 10% 2 nd year: 30%	1 st year: 5%, aims at 30% finally	1 st year: 10% 2 nd year: 20%	aims at 30%
Current achievements	over 30%	10% - 15%	about 20%	20% - 25%

In measuring the percentage of curriculum using IT, Singapore schools use an "IT Resources Electronic Booking System" set up in the school Local Area Network (LAN) to generate reports. This reflects the utilization of IT resources. In order to facilitate the IT education, strategies like 'Content Reduction' and 'Inter-discipline Project Work' are adopted to provide more chances for

IT teaching and enhance collaborative work among subjects. The Education Department provides clear guidelines and a lot of resources for schools in the above-mentioned aspects, whereas in Hong Kong, support from the Education Department seems to be insufficient. In addition, some IT preparation and continuous computer courses will be conducted to make students more IT-capable. Examples include: a 5-week computer course for pre-Secondary one students in Serangoon Secondary School and a four-year computer application course in Dunman Secondary School.

Computer Equipment & Facilities

The computer equipment and facilities possessed by the four visited schools are listed below:

	Dunman	Anglican High	Manjusri	Serangoon
No. of Computer Labs. (with 41Ws)	5	3	4	3
No. of IT Learning Centres (with 21 Ws)	5	2	3	4
Media Resource Library	1	1	1(with 22 Ws)	1(wireless Internet access)
Computer to teacher ratio	1:2	1:2	1:2(1:1 for Head of Department)	1:2
Computer to student ratio	1:5	1:5	1:2	1:5
LCD Projector System	all classrooms	all classrooms	13 classrooms	all classrooms
Others	Storage space: - 40MB for each teacher - 10MB for each student	Teacher's console in S1-3 classrooms	Notebook for teachers	Storage space: - 150MB for each teacher

As shown from the table, a Singapore secondary school possesses more computer laboratories and IT learning centers (at least 5 in each school) while a Hong Kong secondary school usually has only 2 or 3 in total. The IT learning centers are specially designed and the media resource library contains sufficient number of computers to facilitate group discussion and project work using computers. The spacious school environment and sufficient funding provided by the Government are Singapore's superiority. Besides, the fully networked classrooms together with a LCD Projection System can make IT teaching more ideal. As far as resources concerned, the computer-to-teacher ratio is one to two and one to five for computer-to-student. It is roughly equal to the ratios in Hong Kong.

Human Resources

A Singapore secondary school usually has an ITMRL (Information Technology and Media Resource Library) Department led by a head teacher. In addition, two technicians are recruited by the Government and dispatched to each school to provide software training and hardware support services for the teachers in the school.

Application Software & Educational Software

In Singapore, the Government has purchased the necessary software (such as Windows, Office) for installation in schools' computers. Although it is not common to see the school upgrading software frequently, the schools already find the software sufficient for them to use effectively. The majority of students own a computer at home and are authorized the rights to use the software at home.

In school, each subject is allocated several thousand dollars to purchase IT resources including educational software. However, schools commented that there was not sufficient and suitable educational software available. Two ways of solving this problem are to encourage the search for suitable resources in the World Wide Web and develop suitable software in cooperation with the software companies. This is quite similar to the situation in Hong Kong.

IT Programmes & Activities

Two common types of learning in which IT is used as a tool in the four visited schools are the Project-based Learning and the Enrichment Courses. The computer laboratories and the media resource library are open for students to do their group work projects. Different subjects also conduct many enrichment courses after school to allow students to learn with computers. Pair work and group discussion are commonly organized during a Computer-Assisted Learning (CAL) lesson to make the lesson more interactive.

Besides, many IT self-learning programs and competitions are conducted in different schools. These include: a Cisco networking programme in which S.2 students learn networking knowledge on the web and are given a CCN Certification after passing a certain level of networking examination on the Web; a saving PC programme in which a student will be awarded the PC he repairs in school; an Edupad (electronic textbook) research project in which students can learn thinking skills, presentation skills and interact with people all over the world; Web page design competition; and so on.

In addition, teachers are familiar with the use of the discussion forums and e-mail functions to discuss with students their academic progress and broadcast test notices respectively. However, broadcasting and submitting assignments through e-mail are not common.

School Administration

In the aspect of administration, Singapore schools apply IT in similar areas but with more maturity than Hong Kong's. Staff are accustomed to communicating through e-mail, processing students'

records as well as their examination results and using the on-line electronic booking system to reserve a computer laboratory. Teachers are willing to accept change and the emphasis on “Learning Nation” and “Thinking Skill” education by the Government enhances the implementation of IT education as they are interdependent on each other in the curriculum design.

Teacher Training

Teacher training is school-based in Singapore. The ITMRL identifies teachers’ needs and assesses their abilities before conducting training courses. Two types of training are organized, the training in application programs and the workshops on how to develop an IT-based lesson. Teachers develop their IT skills progressively with peer assistance. Sometimes, schools invite teachers from other well developed IT schools to share their experience. Moreover, each subject or department has a representative who is better acquainted with IT skills to be the motivator or the helper inside the group. The atmosphere is harmonious.

On the other hand, teacher training in Hong Kong becomes more and more administration directed. Teachers are required to reach certain IT levels before a specified date. A lot of IT courses (BIT, IIT, UIT) are offered for teachers to attend. A portfolio is required to be completed by each teacher to prove he has reached a certain standard. The content taught in the courses might not meet teachers’ needs and abilities. This might result in a situation that teachers become reluctant to attend the courses or not as enthusiastic as before. It is time for us to evaluate the effectiveness of the IT training programs in Hong Kong.

Plans of Singapore Schools

Apart from the current achievements made by the visited schools, they have set down the future plans for applying IT in both school administration and educational aspects. Some of them are developing electronic attendance taking systems, electronic marking systems, electronic teacher record books, electronic textbooks, web-based lessons and on-line sharing of lesson plans and teaching resources.

Conclusion

The exponential growth in the use of communication and information technology (IT) in the past decade has had a tremendous impact on society and our daily lives. It is quickly transforming the way in which education is delivered in schools by breaking down the traditional boundaries of teaching and learning. To respond to this change, the main tasks are to equip our teachers with the necessary IT skills; to apply computer-assisted teaching and learning across the curriculum; to place students in an environment where they can use this technology as part of their daily activities and in an environment where they grow up to use it creatively. Although, in Hong Kong, the five-year strategy in IT Education has been implemented one year later than Singapore and there is a lack of space in school for setting up as many computer rooms as in Singapore, the pace of implementation of IT Education in Hong Kong does not fall behind Singapore in most aspects. The Government and most of the teachers in Hong Kong are enthusiastic and have made great effort to set up school intranets, revise curriculums, develop and/or search for educational software, provide and attend teacher training courses in the past few years. Suppose the Hong Kong Government is willing to

provide us with more resources and support (such as a LCD projection system in each classroom), more full-time technicians, and well-prepared curriculums with suitable educational software and practical training. And suppose all teachers are willing to accept this paradigm shift, to apply it as usual practice in both teaching and school administration, to continuously upgrade their IT knowledge and to bring it to students. It can be foreseen that the success of IT Education as witnessed in Singapore would also be witnessed in Hong Kong in the near future.

