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Are You Ready for IT?

PHILIP WONG
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Scenario 1996

Tan Kok Meng has been a teacher in a neighbourhood secondary school for the past three years. He enjoys his job teaching Geography and English Language in Secondary 3 and 4 to students of mixed abilities. In addition to his regular duties, he is very involved in ECA and is the teacher in charge of the School Choir. He is a very concerned teacher who likes to talk with students about their problems.

Kok Meng wants to make his lessons interesting and believes in being innovative in his approaches to teaching Geography. He cuts out interesting articles from newspapers and magazines, his favourite source being National Geographic. He goes to IML located in Bt Timah once or twice a month to source for video materials, transparencies and other teaching materials to help make his lessons interesting. Occasionally he goes to the Australian and British High Commissions and the USIS to source for other types of materials. He is constantly looking out for materials to stimulate his students and make them curious about Geography.

In his English Language classes, besides conducting the normal classroom activities, he encourages his students to write letters, create scrapbooks, read widely and participate in class discussions. However, he finds his students sometimes have difficulty expressing themselves both orally and in written form. Additionally, they seem to be reluctant to read outside the class materials. They find process-writing exercises a chore to complete as they have to rewrite their essays many times before reaching the final stage. Spelling and grammatical errors are common and he spends lots of time correcting their work and giving feedback. He finds the whole exercise energy sapping and at times frustrating.

Scenario 2001

Tan Kok Meng still teaches in the same school. However, the demands are increasing and he has been given additional duties. He is a student counsellor and has been promoted to become Head of Department for Social Studies. He is still teaching Secondary 3 and 4.

However, in the past few years he has learned to use technology quite a lot in his job. He has a portable computer and a desktop computer on his desk in the staff room. The portable computer has a wireless connection to his desktop computer and to the main computer in the school. Instead of visiting various High Commissions to borrow materials he browses their on-line catalogues and reserves various materials by e-mailing their librarians. With his portable computer he previews digitized video materials from CDIS. His lesson planning now routinely includes browsing Internet to search for video clips, photographs, maps, weather reports, satellite pictures and the latest statistics from various countries. He downloads these materials and stores them into the file storage system attached to the school's network server. He previews computer software developed by various commercial companies and selects various useful software programmes and catalogues his materials using a simple database so that he can locate and select his materials very fast. To prepare his lessons, he uses a simple software that allows him to incorporate text, video, sound, pictures and graphics and present the materials using on-screen projection system. (No more transparencies!) All these integrated materials are saved in the school network storage system and are made available to students for review at a later stage. Now he does not worry if one of his students is absent from class, as the student can recall the daily materials into their own home computer. To cater to students of different ability levels, he monitors their progress through the school's computer-managed learning system. He clicks the name of a particular student and retrieves his bio-data and the progress he has made with the lessons. He then decides whether to assign supplementary materials or perhaps just provide words of encouragement. He communicates with his students outside of class via e-mail or digital audio messages. He notices that even a particular student who was shy and reluctant to participate in class left e-mail messages for him to respond.

He notices that students are getting more involved in their work. They use the computers to compose their essays. Their use of spelling and grammar checkers has actually improved their abilities to spot their own mistakes. They send their essays electronically to their friend's computers for feedback and peer review. They are able to engage in electronic conversation with their friends on their work. Students work in groups interactively to prepare multimedia reports on various topics in geography. They download pictures, video, graphs, articles and incorporate them in their reports. They left messages to their counterparts in other countries asking questions like the weather, the economic situation, and their lifestyles. He also notices that some students have developed a personal correspondence with an e-mail pen-pal from another country.

STW

The scenario in 2001 is not science fiction. The activities Kok Meng carries out will be made possible for all Singapore teachers with the introduction of Student Teacher Workbench (STW). An integrated computer-based learning, teaching, and management system, the STW has two primary components - one for the teacher and the other for the student.

The Teachers' Workbench allows them to perform many teaching, assessing, monitoring functions through the computer network system. The STW will permit teachers to achieve what Kok Meng has in the 2001 scenario. Figure 1 shows a general schematic of the components of the Teachers' Workbench.

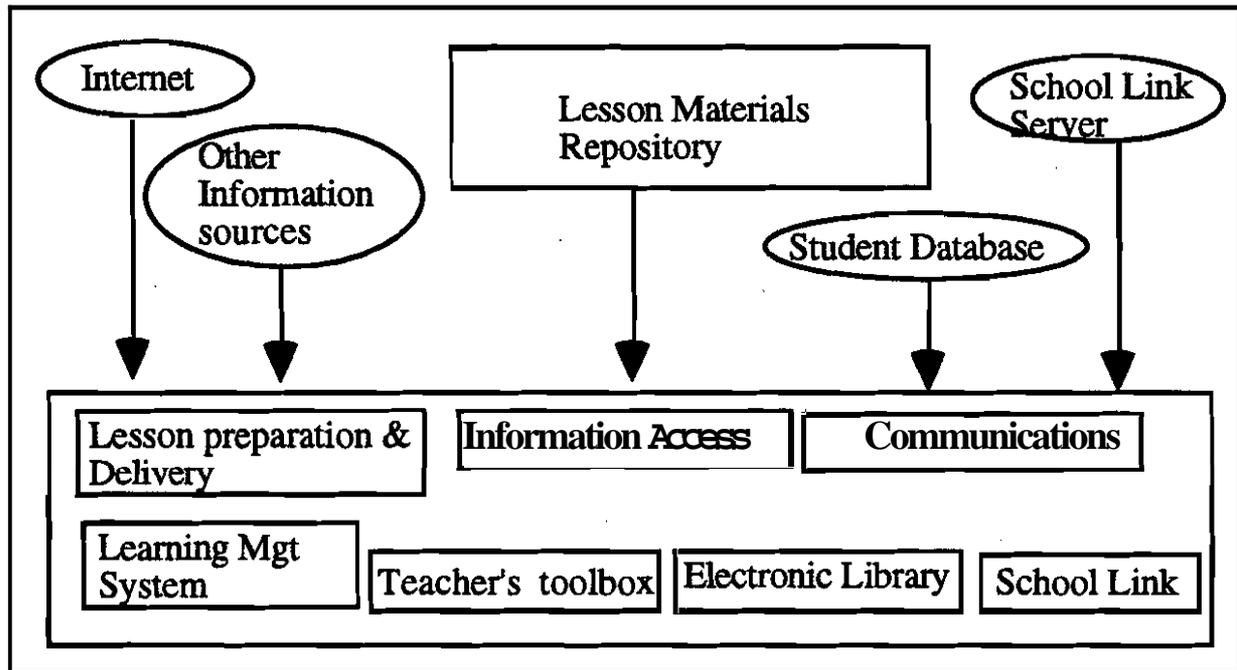


Fig. 1
The Teacher's Workbench
(Ho, 1994, Educational Technology Conference)

At the Student's Workbench (see Figure 2), students will be able to learn materials customised to their abilities and needs, to learn at their own pace and be able to communicate directly with their friends and teachers. Students can communicate with their counterparts from other regions, read the latest news from bulletin boards, gain access to vast amount of digital multimedia materials on the system and from worldwide system to prepare their assignment or to seek information (Ho, 1994). Teachers, students and parents can communicate with one another over electronic mail service thus improving the communication process between them.

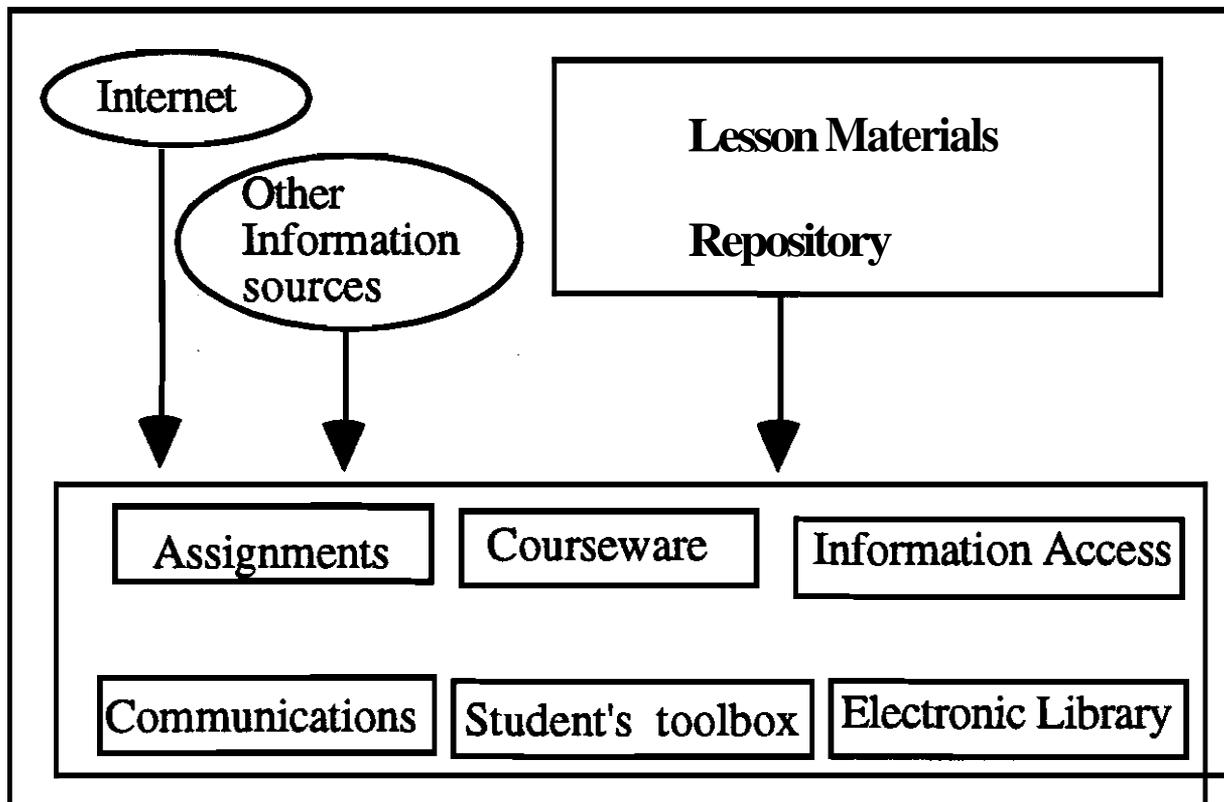


Fig. 2
the Student's Workbench
(Ho, 1994, Educational Technology Conference)

With these new innovations and with an increasing emphasis of using the computers as a tool and as a delivery system for instruction, there are new demands for teachers to have adequate technology skills. Teachers will need to equip themselves with the necessary information technology and computer skills to enable them to tap these resources to facilitate learning.

IT skills for teachers

Given the rapid technological developments occurring in Singapore schools, it is reasonable to ask, "What type of computer skills do teachers require?" That is, what information technology skills do teachers need in order to cope with the future demands of using computers for instruction. Additionally, what skills are necessary for the successful implementation of STW?

In the early eighties, learning to programme in BASIC or Logo constituted part of most instructional technology courses. At that time, there were not many application programs to help teachers use computers, so an introductory course on computers was usually about learning to write a program in BASIC. Programming, however, may now not be a suitable skill for all teachers and will be unlikely to support traditional classroom teaching goals (McFadden & Johnson, 1993). In the nineties, many sophisticated application software programs have been developed and are available to teachers, so teachers can now use the computer as a tool without having to learn a programming language. From recent literature surveyed, for example, guidelines recommended by ISTE (International Society for Technology in Education, USA), skill in programming a computer is not considered as a prerequisite for teachers and thus they do not include this skill as part of the accreditation requirements for teacher training institutes in the United States.

A number of approaches for teacher training in IT have emerged from American institutions which reflect the set of skills deemed important that teachers have when they enter American school systems. However, similar examination of the computer curriculum for trainee teachers in Singapore may not yield the same set of skills and outcomes as arrived at by these American institutions. There are a number of practical reasons why the complete list of technology skills suggested by the American Institutions are not entirely appropriate for teachers in Singapore. For example, most of the American plans include a section on the design and development of computer-based materials for use in the classroom (such as creating a HyperCard stack). In Singapore, one of the functions of the Curriculum Development Institute of Singapore (CDIS) is to design, develop, and evaluate such computer-based materials, and thus this skill would not be considered of practical importance to new teachers.

The suggestion put forth in this paper is to adopt those computer skills which are appropriate for schools in Singapore as competencies in IT. A set of computer skills is proposed to help educators to focus on the skills and knowledge required for present and future needs required for the successful implementation IT2000 in Singapore. The skills incorporate both basic computer skills, instructional and advance technological skills.

Class	Skill	Sufficient levels of competency
<p>1. Basic Computer Skills and Knowledge</p>	<p>1. Understand basic terminology and concepts (e.g., RAM, ROM, icons, bytes, etc.).</p>	<p>Sufficient knowledge to understand the jargon used in computer advertisement.</p>
	<p>2. Execute basic functions of various operating software (Windows95, Macintosh).</p>	<p>Demonstrate the ability to effectively use a computer operating system, including basic hardware (keyboard, mouse, etc.), saving, naming, copying, deleting files.</p>
	<p>3. Use a word processor.</p>	<p>Font usage and style, paragraph format, tables, page layout. Additionally incorporate graphics from clip art to documents.</p>
	<p>4. Use existing School Link programs and templates to update students' database, enter assessment marks, and generate student reports.</p>	<p>Understand the principles of spreadsheet and databases without learning to program them.</p>
	<p>5. Use graphics or presentation applications to prepare instructional materials.</p>	<p>Prepare coloured transparencies, worksheets, bulletin board items.</p>

Class	Skill	Sufficient levels of competency
II. Computer skills for Instruction	1. Exhibit an understanding of educational principles behind effective CAI design and use (e.g., theories of motivation, learner control, screen design, cooperative learning, etc.).	Use an evaluation tool and to determine the quality of a given piece of CBL software, locate instructional materials from various sources.
	2. Select, evaluate and integrate appropriate CAI software into curriculum.	Plan lessons that will incorporate the use of computer resources e.g. management of different computer activities for different students.
	3. Familiarise with the computer learning management systems.	Monitor student's progress and prescribe relevant learning materials.
III. Advanced Computer skills	1. Set-up and use interactive multimedia for instructional and professional purposes.	Integrate pictures, photographs, video, sound and text into a interactive learning system.
	2. Demonstrate the ability to use communication software to gain access to electronic mail and Internet resources for instructional purposes.	Be able to access various network systems, download files and participate in sharing resources. (e.g., bulletin boards, file transfer, WWW).
	3. Demonstrate an understanding of ethical issues in the use of computers in education.	Discuss why these issues (e.g., software piracy, improper access to Internet sites, etc.) are important to students.

Conclusion

The eleven skills included in the list of IT categorisation presented here is a current best guess about the types of technologies which will be available in the year 2000. As with all technological issues, however, there will likely be a need to update this in a few years time. Perhaps in the year 2000 the list presented here will be obsolete.

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