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I T Staff Development: The Need for a Training Plan

Philip Wong &
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INTRODUCTION

The main thrust of the IT Masterplan for Education under the section of Human Resource Development is a call for the training of teachers to “handle IT-based instruction and support new learning strategies among their pupils” (IT Masterplan for Education, 1997). Training of teachers is a key issue and is one of the most important factors that will help to make the IT Masterplan a success. Teacher training in schools on the use of IT (information technology) began in 1997 and is still ongoing. The general strategy adopted by the Ministry of Education is to divide the schools into three phases and provide the schools with initial school-based training conducted by Senior IT Instructors from Educational Technology Division (ETD). However, a one-time off training stint provided by ETD for teachers may not be sufficient to ensure that all teachers are able to handle and design IT-based lessons even though ETD instructors occasionally re-visited the schools that they have trained earlier. Thus, schools which have finished with the initial training of their staff need to plan for any subsequent future training. Training of teachers in the use of IT for instruction has to be ongoing. The questions are: “How will principals ensure that on-going training and development occurs in their schools and, what type of skills and competencies are necessary for teachers to be effective in an IT-based classroom?”

Teachers go through various growth stages in the use of technology in the classroom. For example, many teachers feel comfortable using technology as a productivity tool (e.g. word processing) but are uncomfortable to use them in classroom teaching. But this degree of ‘progressive skill development’ is quite natural and we should expect to have to accommodate a wide variety of skill levels and pace of growth. Dwyer, Ringstaff & Sandholtz (1990) found that teachers go through an evolutionary process in the use of technology. They termed the first stage as *entry level* where teachers learn to adapt to changes in physical environment created by the presence of technology. At the next stage, *adoption*, teachers will have a feel of technology and able to

support some of their text-based lessons with technology. At the next level, *adaptation*, teachers will be able to modify and use various types of technology tools for classroom instruction. Finally, at the *invention* level, they will be able to create new learning environments using technology, as they have sufficient knowledge of the various technology tools. It should be obvious that it takes time for teachers to move through the various stages. In fact, it has been estimated that it takes 5–6 years for teachers to develop sufficient expertise with computers to function comfortably in the classroom. This research study was cited by Glenn (1997) and he strongly advises school administrators to be patient with teachers when it comes to integrating technology into the school curriculum.

STAFF DEVELOPMENT

One of the most important elements in any staff development programme is to assess the training needs required by various personnel in an organization (Picciano 1998). In technology training, identifying the types of skills and competencies to equip teachers with technical expertise as well as pedagogical strategies in IT is vital for the success of staff development. Quite commonly, principals adopt a ‘whole staff’ training model where every teacher in the school, irrespective of whether the teacher is knowledgeable or not, must attend the course of training. This method is not efficient and could even be counter productive especially on the attitude of the more advanced teachers. The principal must empower teachers to make the decisions about the type of training he/she would like to attend. There is a potential drawback, however, to complete empowerment. Some teachers may not know what type of training to attend because he/she does not know the type of skills and competencies necessary to work in a technological teaching environment. It is with such a situation in mind that we came out with a list of competencies to guide the teachers to make a decision on the type of IT training required.

COMPETENCY LIST FOR TEACHERS

The following is a list of competencies teachers in Singapore schools will find necessary to develop in order to meet the demands of the IT Masterplan in Education. We have refined the model of Dwyer *et al.* (1990) and placed it more into the Singapore context, resulting in a classification with three developmental stages: *Acquisition*, *Application*,

and *Innovation*. In the *Acquisition* stage, teachers build up foundation IT skills and become comfortable using IT jargon, and in using general IT productivity tools. In the *Application* stage, teachers become more knowledgeable about how to select and evaluate CBL, and to integrate IT into their lesson. In the final stage, *Innovation*, the teachers become very adept using computers, even to the extent they can author their own multimedia materials for use in their classes, and to design and maintain their own instructional web sites.

It is assumed that teachers will follow the sequence of stages more or less developmentally, that is, needing to complete the Acquisition stage competencies before progressing to the Application stage competencies, and then on to the Innovation stage. Within each stage, however, there is not particular order for the competencies shown here.

ACQUISITION STAGE

At this stage, training should be done to help teachers feel comfortable with the computer and help them employ simple productivity tools in administration, classroom preparation of learning and teaching materials, and personal work. At this foundation stage, it is most important for teachers to feel at ease working with computers even though they may not be too familiar with many of the technical details.

DEMONSTRATE A BASIC UNDERSTANDING OF VARIOUS TERMINOLOGY AND CONCEPTS ASSOCIATED WITH COMPUTER SYSTEMS, HARDWARE, AND SOFTWARE

- Sufficiently comprehends the jargon used in computer advertisements.
- Understands new jargon that continually appears in newspapers, magazines, and television programmes.
- Understands the country's copyright laws and other legal issues related to IT.

EXECUTE BASIC FUNCTIONS OF VARIOUS POPULAR OPERATING SYSTEMS (WINDOWS95, MACINTOSH OS)

- Demonstrates the ability to effectively use a computer operating system, including basic hardware (keyboard, mouse, etc.), and file saving, naming, copying, deleting.

- Demonstrates the ability to install CD-ROM titles and other software.
- Uses virus scan programs to prevent virus infection of computers.

USE A WORD PROCESSOR

- Produces documents which show flexibility and discernment in font usage and style, paragraph format, tables, page layout.
- Is familiar with editing functions and be able to use various tools such as spell checker, thesaurus, etc.
- Incorporates from clip art graphics into documents

USE EXISTING PROGRAMS AND TEMPLATES TO UPDATE STUDENTS' DATABASE, ENTER ASSESSMENT MARKS, AND GENERATE STUDENT REPORTS

- Understands the basic principles of spreadsheet and databases.
- Formats and sorts spreadsheet and database data to produce various types of printed reports.

USE GRAPHICS OR PRESENTATION SOFTWARE TO PREPARE INSTRUCTIONAL MATERIALS

- Uses various types of templates in presentation software.
- Inputs text, graphics, and simple animation to make effective on-line presentations.
- Uses features such as animation, incorporating digitised sound and video and screen transitions to enhance on-screen multimedia presentations.

DEMONSTRATE THE ABILITY TO USE COMMUNICATION SOFTWARE TO GAIN ACCESS TO ELECTRONIC MAIL

- Uses a communication tool effectively to send and receive electronic mail.
- Attaches various documents to e-mail and able to extract any attachment to electronic mail.

DEMONSTRATE SKILLS FOR USING INTERNET AS A PERSONAL AND PROFESSIONAL RESOURCE BASE

- Understands the basic workings of the Internet.
- Browses the Internet to obtain relevant and pertinent information for teaching.
- Uses various types of search engines to seek information to support classroom teaching.
- Downloads files, capture images, and access newsgroups.

APPLICATION LEVEL

Training at this level concentrates on the effective pedagogical skills related to IT. Just having familiarity with basic terminology related to IT, and foundation skills in the operation of basic software for simple personal and classroom tasks is not sufficient to call a teacher completely 'IT literate'. The teacher additionally needs to be able to truly integrate IT into lessons, to evaluate commercial instructional software, and to be able to make informed decisions about the effective general use of IT to support lessons.

EXHIBIT AN UNDERSTANDING OF EDUCATIONAL PRINCIPLES BEHIND EFFECTIVE COMPUTER-BASED LEARNING (CBL) MATERIALS AND THEIR APPROPRIATE USE

- Identifies the advantages and disadvantages of computer-based learning.
- Is aware of the pedagogical uses of computer-based learning materials.
- Is familiar with computer learning management systems.
- Is familiar with new paradigms of teaching in which the role of the teacher is as a 'facilitator' of independent student activities.

SELECT AND EVALUATE CBL SOFTWARE WHICH ARE APPROPRIATE FOR THE INTENDED AUDIENCE

- Uses an evaluation instrument to determine the quality of a given piece of CBL software, and can locate instructional materials from various sources.

INTEGRATE CBL SOFTWARE AND OTHER RELEVANT MATERIALS INTO THE SCHOOL CURRICULUM, AND DESIGNS CLASSROOM ACTIVITIES

- Plans lessons that will incorporate the use of computer resources (e.g. development of different computer activities for different students).

USE INSTRUCTIONAL APPLICATIONS AND TOOLS FOR THE PROMOTION OF CREATIVE EXPRESSION AND COMMUNICATION

- Is familiar with the process of the development of creative expression and problem-solving.
- Designs lessons which guide students through the creative process, using IT-based instructional tools.

UNDERSTAND THE USE OF INTERNET AS A TEACHING AND LEARNING TOOL

- Provides guidance for students to identify learning resources on the WWW.
- Uses elements of internet (e.g. chatting, e-mail, discussion boards, newsgroups) for collaborative and cooperative learning.
- Designs relevant lesson activities for the Internet, used by either the teacher, the students, or both.

INNOVATION STAGE

At this stage of training, teachers who are very comfortable with the Acquisition and Application stage can further developed in innovative uses of IT in teaching and learning. They can design innovative lessons integrating IT in novel and flexible ways. Additionally, teachers are able to develop new multimedia 'micro-lessons' for students (that is small multimedia lessons to address very specific teaching points), and are fluent in the design and use of instructional web pages. Teachers who are IT leaders in the school could conduct workshop sessions for their fellow colleagues.

USE VARIOUS SUBJECT-BASED COMPUTER TOOLS FOR LEARNING

- Explores the use of subject specific software. (e.g. mathematics teachers at the upper secondary level should acquire skills in using software which allows the manipulation of mathematical functions, plotting trigonometric functions, etc.).

PROMOTE STUDENT USE OF VARIOUS GENERAL APPLICATION TOOLS (E.G. PRESENTATION, WORD PROCESSING, SPREADSHEET, DATABASE) FOR INSTRUCTIONAL PURPOSES

- Understands the rationale behind the use of these applications by students.
- Designs classroom activities in which students actively use these tools.

AUTHOR INTERACTIVE MULTIMEDIA FOR INSTRUCTIONAL AND PROFESSIONAL PURPOSES

- Demonstrates instructional design principles and procedures.
- Integrates pictures, photographs, video, sound and text into a interactive learning system.
- Constructs an interactive multimedia 'micro-lesson' for use by students.

CREATE AND MAINTAIN INTERACTIVE AND INSTRUCTIONAL WEB PAGES AND WEB SITES

- Understands essential web authoring concepts (e.g. HTML, Java scripting).
- Demonstrates design principles and procedures relevant to instructional web pages.
- Is fluent in using web page design tools and HTML editors, as well as other supporting graphics and multimedia tools.
- Understands the structure of intranets and their role in the delivery of on-line instruction.

CONCLUSION

Many research reports have concluded that support, both technical and instructional, is crucial for the initial implementation stage of technology integration in the classroom (e.g. Maddin 1997, US Congress Office of Teaching Assessment 1988). These reports urge schools to think through the kind of support that is given, to recognise that it is very common that technology integration fails because of poor planning. Maddin (1997) said, "Too little thought is given to maintaining a school environment that nourishes the initiative. For benefits to be sustainable, well-planned staff development must be followed by a maintenance system." Principals, Heads of Department and School IT coordinators should sit down and devise a strategic staff development plan and a support system to ensure the success of the schools' own IT plan.

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