Chapter 9
Enhancing ICT Application in Science and Mathematics Education:
The Malaysian Smart School Experience

Suan Yoong
Sultan Idris University of Education, UPSI, Malaysia

Lee Yuen Lew
Long Island University, C. W. Post Campus, USA

ABSTRACT

This chapter reviews the Malaysian experience in implementing the Smart School Flagship initiatives, notably in the implementation of information communication technology (ICT) application in science and mathematics education. From a macro perspective, this chapter takes stock of the achievements of the Smart School Flagship in enabling ICT infrastructure and Internet connectivity in Malaysian schools. It attempts to appraise current trends and practice, clarifies emerging issues or challenges that schools face in trying to improve the ways in which ICT is applied to enhance teaching and learning, and identifies promising good practices so that general lessons may be drawn that are of interests to Malaysia and other countries. It does not claim to comprehensively cover every aspect of the initiatives but aims to contribute to current thinking about this topic by presenting a practical and pragmatic evaluation of some of its key features.

INTRODUCTION

Throughout history, we have witnessed how new technologies transformed society in every walk of life: the work place, trade and commerce, communication, entertainment, and education. As technologies race forward, potential applications of technology constantly stimulate imaginations, offering numerous exciting possibilities in every field. Technological innovations in the new millennium are characterized by unprecedented rates of change and improvement, often in the strides of geometric progression. The rapid spread and infusion of information communication technologies (ICT), especially through the Internet, into every phase of contemporary life, and the optimistic ex-

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pectations held by most people towards the new innovations have without doubt, fueled tremendous growth and enthusiasm in the application of ICT in education worldwide.

With the promises of ICT being brightly sketched and the potential impacts of ICT in education highly heralded, the rapid upgrade in the development of hardware and software means that great deals are now possible. Moreover, because hardware and software prices have dropped significantly, institutions of learning are upgrading their ICT infrastructure and facilities. There have been significant developments in teacher expertise and confidence in ICT, and ICT resources are also increasingly becoming available to support teaching and learning. Nonetheless, there remains a considerable gap between the aspirations of experts and the realities of the classroom. The application of ICT to teaching and learning, specifically in science and mathematics education, hardly reflects the state-of-the-art of current technological advances. Indeed, in the rush to embrace new technologies, one may risk ignoring pertinent issues that have far reaching implications for practice.

Malaysia is one of the newly industrialising countries which has benefited from a very rapid rate of economic growth. Educational development has figured prominently as an integral part of the government's developmental policy as spelled out in every Malaysia Plan (Malaysia, 2006). Developments in Malaysia in the last three decades have amply demonstrated that education and training are powerful social engineering tools towards achieving its educational goals. In the early nineties, Malaysia expressed its aspiration to fulfill the objective of full industrialization by the year 2020 in a new policy document called *Vision 2020* (Mahathir, 1991). One of the strategic challenges spelled out in the document was the need for Malaysia to establish a scientific, progressive, innovative, and forward looking society by 2020 – a society that is not only a mere consumer of technology but also a contributor to the scientific and technological civilisation of the future. Attaining such an objective requires human resource planning to train ICT literate and highly skilled human power that has broad based education at the primary and secondary level.

Toward this end, a master plan known as the Multimedia Super Corridor (MSC) was formulated (MSC, 1996) whereby the upgrading of the country's ICT infrastructure, connectivity, and penetration in all fields of application, including education, became an integral part of the national development policy. Correspondingly, the Smart School Flagship initiative (Malaysia, 1997a; 1997b; 1997c) was formulated to equip all Malaysian schools with computers and other ICT facilities, especially Internet access, so as to implement ICT application in support of education in general, and science and mathematics education in particular.

THE MULTIMEDIA SUPER CORRIDOR (MSC) PROJECT

Major international forums have given considerable attention to the role that ICT can play in social and economic development (G8 Heads of State, 2000; OECD, 2001, 2006; World Bank, 2003; United Nations, 2005). This role is most pronounced in the developed countries where technology has permeated businesses, schools, and homes and changed the way people work, learn, and play. ICT is viewed as an engine of growth for the global economy and its potential to enhance the quality of life of the people is highly acknowledged. In an increasingly globalising economy, nations fear lagging behind and loosing their competitive edge if they do not respond to human resource development that is capable of meeting the demands of the information age. Thus, attention is focused on nurturing a workforce skilled in ICT through education, training, and lifelong learning in order to increase national productivity. Naturally, more and more