

**PRESENT-DAY PROFILES, PROSPECTS AND  
CHALLENGES ON THE USE OF ICT FOR EDUCATION  
IN SOUTH EAST ASIA**

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# PRESENT-DAY PROFILES, PROSPECTS AND CHALLENGES ON THE USE OF ICT FOR EDUCATION IN SOUTH EAST ASIA\*

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## 1.0 Introduction

The advent of newer communication technologies and the refinement of existing educational media delivery systems have considerably affected the educational environment the world over. The focus of this paper is the profile of the emerging landscape, potentials, challenges and issues on the use of newer technologies and ICT in the education sector of ten Southeast Asian countries. They constitute a distinct geographical grouping of nations which amalgamated in the mid-fifties, eventually forming the Association of Southeast Asian Nations or ASEAN.

The paper has two parts: the first part describes the profiles of the present socio-economic realities in the Southeast Asia Region which bear upon education in formal and non-formal education. The second part discusses possibilities and potential entry points of ICT in the educational arena, as well as issues, concerns and other considerations on the use of educational application of ICT. Also discussed are some specific initiatives which could provide possible insights in the planning and implementation of ICT-based educational efforts.

Emphasized in the presentation are the growth dimensions, changes and shifts in the socio-economic realities that play major roles in the shaping of education initiatives in the region, particularly the use of various delivery modes using ICT and other alternative learning schemes. The uneven developments and diversity of the contexts of these countries are described together with possible strategies to address the issues and concerns in the non-formal education arena. The major challenge is the choice of ICT-assisted strategies that are affordable, accessible and may be harnessed in a manner and proportion that are attuned to the learners' socio-cultural environment and orientation. This paper draws attention to the ultimate objective of ICT which is to serve as a primary artery of delivering education and eventually help in development of the countryside in the Southeast Asian countries.

Likewise presented are opportunities for regional cooperation and interface between and among the countries of Southeast Asia in terms of sharing

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knowledge, resources, both human and physical, as well as addressing common concerns in the region.

## 2.0 The Present-day Southeast Asian Landscape: Implications for the Use of ICT in Education

Set in the context of unprecedented developments in technology the world over, Southeast Asia is among the world's geographical groupings presently undergoing considerable transition. The region has an over-all population of more than half a billion, constituting more than ten per cent of the world's population. The countries in this region are: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

The region shows the following attributes:

- covers a landmass and population diversity almost equal to that of Europe
- possesses cultural and ethnic diversity
- one of the fastest growing economic groupings in the world
- its work force faces the urgent need to compete in the global arena, and needs to have world-class competencies and ability to work in a multi-cultural, multi-skilled workplace

**2.1 Uneven Economic Profile.** Economic diversity is presently evident among the countries of Southeast Asia. Uneven economic development profiles are shown in a recent UNDP Human Development report:<sup>1</sup>

### *HDI Ranking of Southeast Asian Countries*

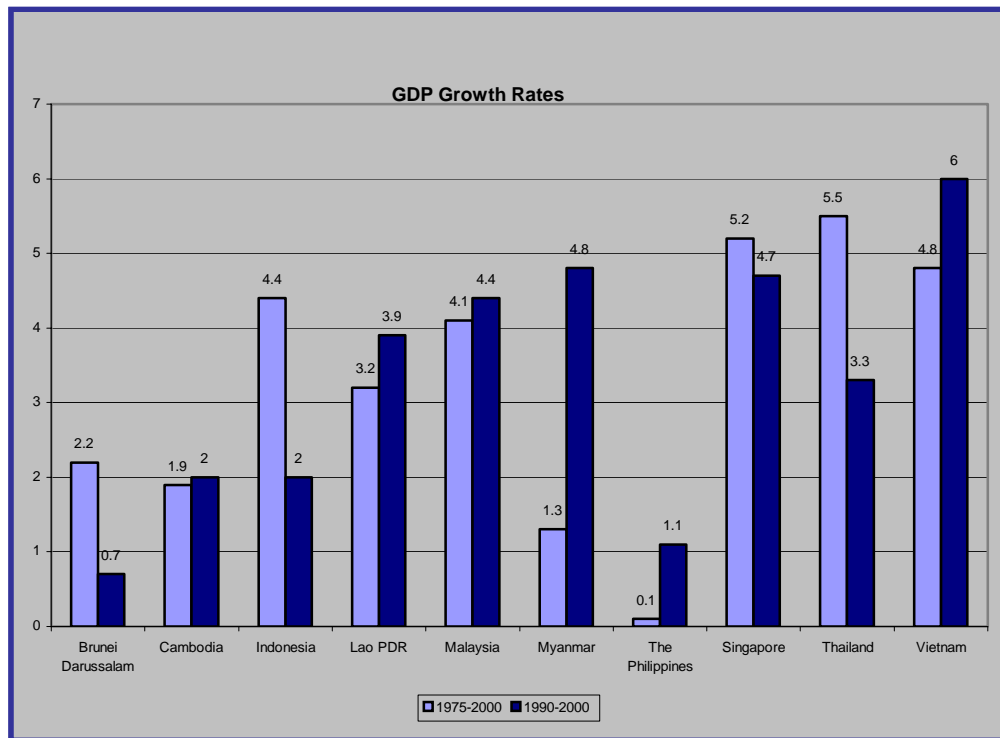
- High HDI rank                      Singapore  
   Brunei Darussalam
- Medium HDI rank                Malaysia  
   Thailand  
   The Philippines  
   Indonesia  
   Vietnam  
   Myanmar  
   Cambodia
- Low HDI rank                      Lao PDR

Two countries in the region are placed at the high HDI rank category: Singapore and Brunei. Seven belong to the medium HDI rank category: Malaysia, Thailand, the Philippines, Indonesia, Vietnam, Myanmar, Cambodia, and; Lao PDR is ranked as a low HDI country.

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<sup>1</sup> Source: UNDP 1999 Human Development Report

Following is a synthesis of the annual GDP profiles of the ASEAN:



In terms of economic growth, the ASEAN countries have registered considerable economic growth in the past three decades. For instance, the 2002 UNDP Human Development Report shows that, Singapore's *per capita* Gross Domestic Product approximates that of the United Kingdom, Italy and the other OECD countries. From 1975 to 2000, its annual growth rate 5.2 per cent; in the last ten years, it registered a 4.7 per cent annual growth rate. The same UNDP report places Thailand as a medium-level HDI (Human Development Index) country, which has also shown positive growth in the last 25 years with an average of 5.5 per cent annual GDP growth rate. While this growth was hampered by the 1997 financial crisis in the region, still it had 4.4 per cent per annual growth rate from 1990 to 2000.

A major change brought about by this positive economic growth is the fast urbanization of the landscape of Southeast Asian societies. The "passing of traditional society" is evident in the sense that the once traditional villages are rapidly becoming urbanized. In 1975, only about one third of the population in the region lived in the urban areas communities. At present, nearly half of the population in the region lives in the cities (43.7). This trend is expected to increase to 53.04 per cent by 2015. Increasing diversification and shifting social roles and functions are very much in evidence in many ASEAN countries. Also noted is the accompanying growth of specialization of functions and the shift from agricultural work to services and information related activities.

However, while the diversity in growth rates is a notable dimension in the region, so is poverty incidence among the ten Southeast Asian countries. A case in point is the Philippines, where about 40 per cent of the population is below the national poverty

line. Malaysia and Thailand have 15.5 and 13.1 per cent, respectively and Lao PDR has nearly half, 46.1 percent, living below the national poverty line (UNDP HDR 2002). It is further observed that with poverty comes the other accompanying concerns such as health, nutrition, uneven access to medical services, drugs, crime and other social maladies.

**2.2 Divergent Population Profile.** Still another point of diversity in the region is in terms of population profiles of the ten countries:

Country	Population	Growth Rate (%)
Brunei Darussalam	00.03	3.2
Cambodia	11.00	2.5
Indonesia	209.40	1.6
Lao PDR	05.40	2.9
Malaysia	23.00	2.4
Myanmar	48.90	2.1
Philippines	75.80	2.3
Singapore	3.90	0.7
Thailand	62.60	1.5
Vietnam	80.30	2.3

Total Population of Southeast Asia: 520.6 Million

The population trends in the region shows that:

- Population of Southeast Asia and the Pacific is expected to reach 629 Million by 2015
- Southeast Asia is expected to have a very young population.

**2.3 Uneven Information/Communication Infrastructure.** The Southeast Asian countries have good beginnings in terms of information/communication technology development. Singapore possesses the qualities of an information endowed country. In many urban areas in Southeast Asia, the Internet is starting to be a part of the information sector. Many hardware manufacturing entities are located in the region. Consequently, information services such as call centers are showing positive growth.

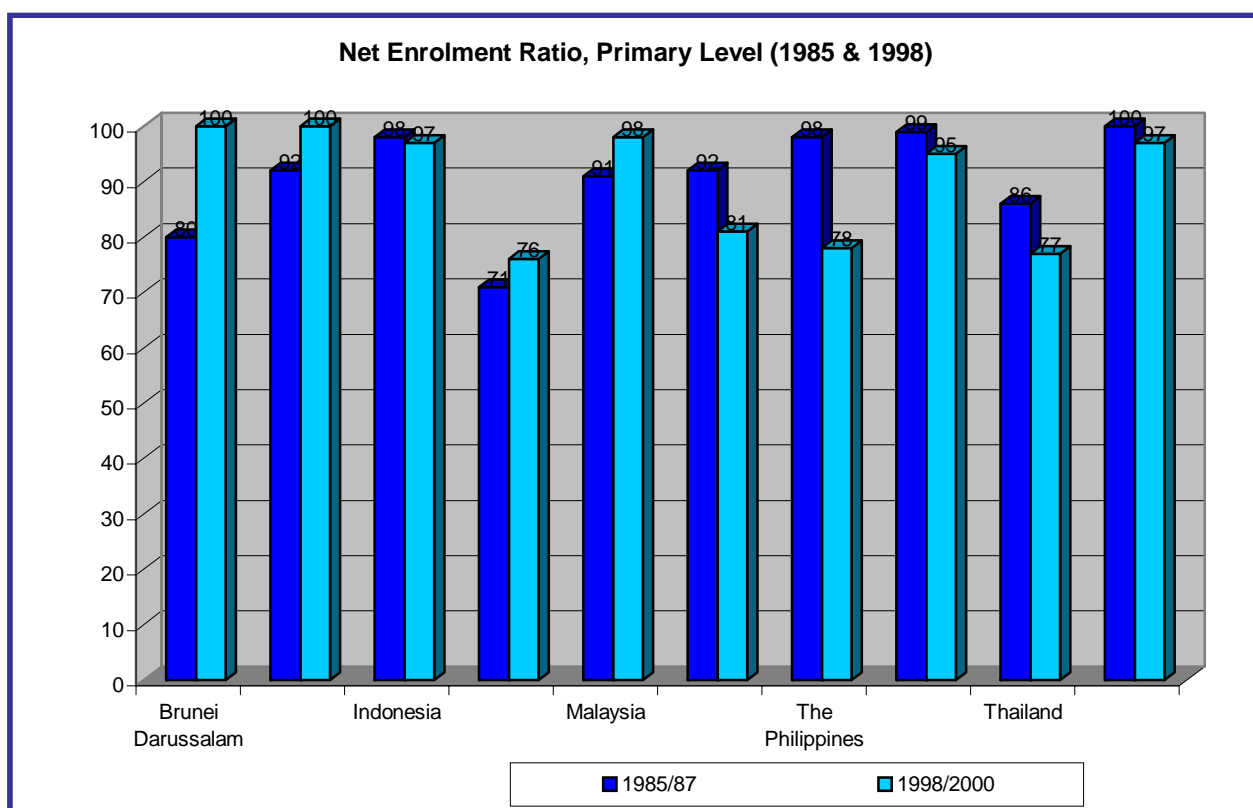
The 2002 HDR reports that the telephone mainlines available for every thousand people in the region in 1990 was 619. In 2000, the figure increased to 1,139. A significant development is the growth of cellular phone sector, which would tend to show that it is a cost efficient alternative to the limited access and high development costs of conventional landlines.

One major regional characteristic is that the technology backbone varies significantly from country to country and within each country. On the whole, the number of Internet hosts in the region has been steadily growing over the past decade. Throughout the region, there were roughly 7.4 Internet hosts per thousand people in 1990; in a decade, this has grown to 64.2 Internet hosts. The biggest growth occurred

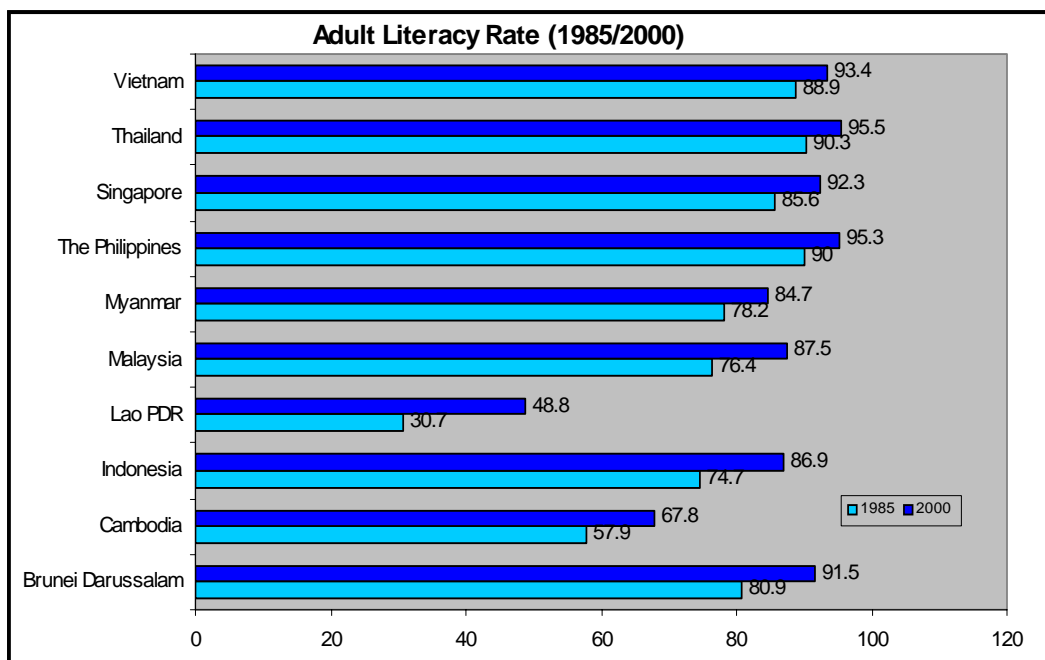
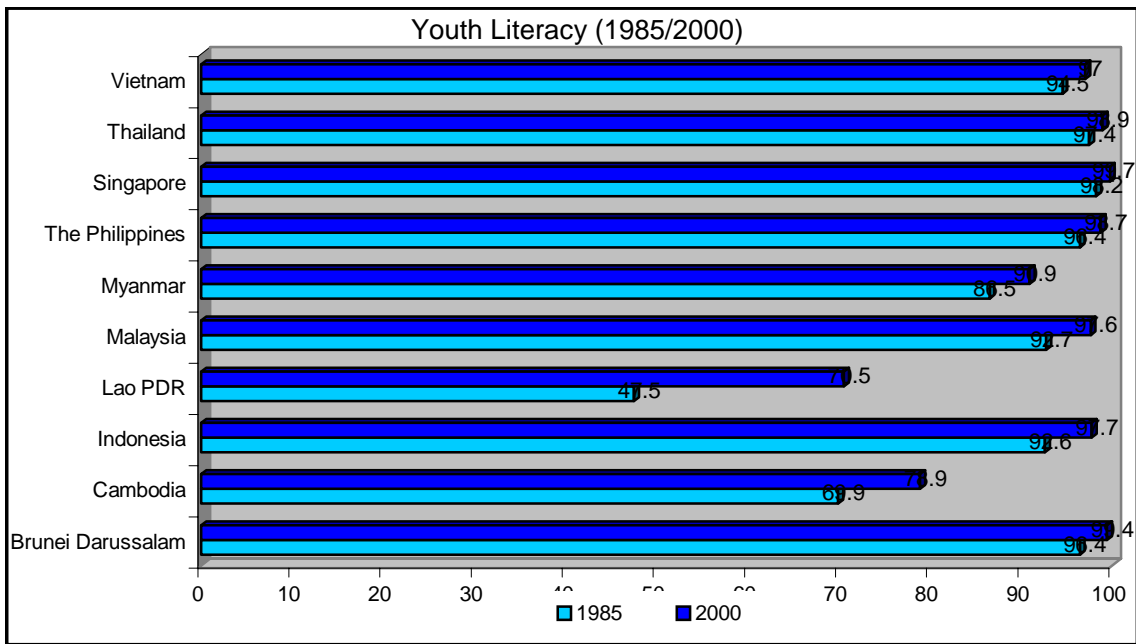
in the countries that have a fairly large share of Internet hosts. Some countries, however, have yet to reach a critical mass of service providers that can pave the way for more widespread Internet use. The ratio of telephone mainlines per thousand people is highest in Singapore with 484; in contrast, two (2) mainlines are shared by a thousand people in Cambodia. Internet access is provided by 3.1 hosts for every thousand people in Malaysia. A tenth (0.3 hosts) of that number serve the Philippines. Within countries, similar patterns are evident. Beyond the urban centers, access to the Internet and communications facilities thin out, even access to reliable electricity service is a challenge.

Moreover, it is recognized that some countries have yet to achieve a critical level of technological capacity that helps accelerate further and more widespread use of technology, particularly in areas where inputs are deemed critical.

**2.4 Positive Performance in Education.** The region has positive accomplishments in universalizing literacy and providing access to basic education, as shown in the following:



The countries of Southeast Asia have marked accomplishments in improving equity of access to basic education. There have been increased net enrolment ratios over the past 15 years or so. It is to be noted, however, that while access to basic education in the region has improved substantially, universal access to education for all children of school age has yet to become a reality in all countries in the region. Still another concern is quality improvement. This is a common focus of many educational initiatives of Southeast Asian countries as evidenced by programs and projects assisted by donor organizations.



The foregoing figures show that there are likewise significant improvements in the areas of increasing youth and adult literacy in the region. For instance, Lao PDR's literacy level for the youth, those aged 15 to 24, has grown from 47.5 percent in 1985 to 70.5 percent in 2000. Subsequently, adult literacy (those aged 15 years and older), grew from 30.7 to 48.7 percent for the same index years.

### **3.0 Major Educational Developments in Southeast Asia: Emerging Potentials, Prospects and Challenges on the Use of ICT in Education**

The rapid and far-reaching but varying degrees of developments point to considerable opportunities among the countries of South East Asia to explore strategies and approaches as well as to confront the present-day challenges in the use education, both the formal and non-formal education sectors.

**3.1 Developments in Educational Settings.** The world over, learning environments are fast becoming borderless, embracing a lifelong dimension, with the pace of knowledge acquisition described as unprecedented. Lifelong learning is one of the key concepts expounded in the *Report of the International Commission on Education for the Twenty-first Century* (UNESCO 1996). The once clear dividing line between the world of learning and the world of work is fast disappearing and is giving way to a seamless educational environment, with learning taking place anytime, anywhere and under various settings. Physical facilities like schools and classrooms which were once upon a time considered as the only learning places do not anymore have the monopoly of being called educational settings.

With numerous educational avenues available to the learner, the teacher is not anymore the only source of knowledge. Many other delivery modes have emerge as providing the learners with knowledge, skills and competencies. Further, lifelong education as expounded by the Delors Commission, does not only relate to continuing learning but also to the individual development and maturity associated with an acute sensitivity and tolerance to others' cultures, beliefs and traditions, while anchored on due recognition of ones individuality and role in society. Thus, we are guided by the principle that learning is not a phase one graduates from and nearly divorced from real life; rather it is a continuing record of an individual's life experiences, enriched and guided by various sources.

**3.2 Mass-based Educational Delivery for the Ever-growing Population of Southeast Asia.** In many countries of Southeast Asia, the population growth outpaces the national capacity to provide learning opportunities to individuals and groups. Mass participation in education needs to be addressed by the education sector. A corollary concern that needs to be addressed in the region is the increasing and increasingly younger population, with their peculiar learning demands and needs. This is evident not only in countries with high populations whose educational delivery systems are saddling society's and government's capacity to provide quality learning. The education sector in the region needs to develop innovative and creative ways to enable young people to complete basic education and prepare themselves to higher levels of specialization.

**3.3 Recognition of Equivalent and Prior Learning.** Likewise, many countries of Southeast Asia have begun to explore strategies focused on recognition of prior learning, accreditation and equivalency. An emerging concern in the education landscape is that with education increasingly

becoming seamless and borderless and taking on a lifelong dimension, can a *life-wide* dimension be too far behind? Premised on the assumption that education takes place anytime, anywhere and in various situations, the learnings and competencies gained from present or past practice of a craft, trade or provision of service, are now being given due recognition and credit. Many countries in the region, at different degrees and forms, are adopting such a stance to recognition of learning.

In the Philippines, the accreditation and equivalency strategy is focused on the sub-university or basic education level. The system is designed to enable the school leavers who, because of economic or personal reasons, are unable to complete basic education. With completed secondary education being a requirement for better-paying jobs, the programme provides new opportunities for the learners to acquire accreditation for learnings outside the formal stream thus be better equipped for work. At the same time, the programme also enables school leavers to gain credits and prepare them for tertiary education. Further, a number of higher education institutions in the Philippines presently implement the *Expanded Tertiary Education Equivalency and Accreditation Programme*. This programme is designed to recognize/accredit formal, non-formal and informal learning as well as work experiences related to their learning programmes which have been acquired through different modes .

#### **3.4 Development of Work-specific and Off-campus Learning Strategies.**

Fast emerging in Southeast Asia are varied modalities for learning and acquiring further education. Many countries like the Philippines now utilize dual training systems, adapted from the German model. In-school and off-school learning systems, community-based delivery systems and other variants and modalities are being developed and tried out all over the region.

Investments made by foreign business and movement of industries from the industrialized countries to the developing countries in the region have prompted development of innovative approaches to tradecraft training in the Asia-Pacific countries. Many business groups have initiated a number of these developments, and they help enrich the knowledge pool in the education sector.

#### **3.5 The Positive Growth of Open Learning and Distance Education As Educational Delivery Systems.**

At present, open learning systems and distance education programmes are considered as major delivery mechanisms the world over, including Southeast Asia. They have features that can serve the learner of the 21<sup>st</sup> century who is fast becoming his own teacher. Since he gains knowledge in his home, his work station, or even in places of recreation, education is now able to reach him in these places through various distance delivery modes. Attention of both Jomtien and Dakar is “reaching the unreached and including the excluded.” The educators of the Southeast Asia have the responsibility of reaching into its arena of technological tools, approaches and learning systems in order to achieve this goal.

#### 4.0 Emerging Policy Environment and Program/Projects on ICT for Education

<p>Brunei Darussalam</p>	<ul style="list-style-type: none"> <li>▪ Its National IT Council aims to lead and facilitate the strategic development and diffusion of the state-of-the-art IT for the entire nation (by exploiting IT to its full potential for national prosperity)</li> <li>▪ ICT is one of the growth areas reflected in one of the chapters of the 8<sup>th</sup> National Development Plan 2001-2005</li> </ul>	<ul style="list-style-type: none"> <li>▪ National Drive towards <b>Paperless Society</b> by increasing ICT literacy in the country which will (directly and indirectly) benefit the business community as well as the community as a whole (e-government &amp; e-business)</li> <li>▪ Promotion of ICT-related activities by the Information Technology Department (ITD), the national computer society and the private sector through: National computer quiz for primary and secondary schools; Information drive on use and operation of ICT devices; Training on computer applications; Development of homepages; Annual computer fair</li> <li>▪ <b>e-Education</b> – e-learning &amp; e-library</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-service and in-service teacher training on ICT</li> </ul>
<p>Cambodia</p>	<ul style="list-style-type: none"> <li>▪ In February 2003, UNESCO supported the Ministry of Education, Youth and Sports (MOEYS) to formulate policies and strategies on ICT use in education which resulted to four policy approaches: <ul style="list-style-type: none"> <li>○ ICTs as a need for all teachers and students;</li> <li>○ ICTs as a teaching and learning tool and as a subject itself;</li> <li>○ ICTs as a means to improve productivity, efficiency and effectiveness of education management; and</li> <li>○ ICTs for the promotion of Education for All through distance education and self-learning</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ With the help of international community, different programmes/ projects were launched to bring ICT to the country: <ul style="list-style-type: none"> <li>○ <b>VillageLeap.com</b> – established 3 computer-equipped schools in a remote and inaccessible area in Cambodia in 1999</li> <li>○ <b>CambodiaSchools.com</b> – built schools (with provision of electricity and Internet connectivity) thru donations</li> <li>○ <b>Digital Divide Data (DDD)</b> – began in 2001 and provided digitalisation services to international customers and providing IT training and well-paying jobs to Cambodian workers</li> <li>○ <b>Community Information Centers (CICs)</b> – established 22 CICs around the country in 2003 to provide local communities with access to e-mail, the Internet, a new Khmer web portal and other computer-based services</li> <li>○ <b>Women’s Media Centre Radio</b> – non-formal education initiative to improve participation and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Efforts were made by the Cambodian government and the international community to train pre-service and in-service teachers in ICT skills and the use of ICT to improve teaching and learning</li> <li>▪ Participated in the SEAMEO INNOTECH programme in 2002 for a training course entitled <b>Technology Applications in Education: Teachers and Teacher Trainers</b> (held in the Philippines)</li> </ul>

		<p>portrayal of women in the media</p> <ul style="list-style-type: none"> <li>○ <b>Cisco Networking Academies</b> – the UNDP Asia Pacific Development Information Program and Cisco Systems, Inc. taught students to design and maintain computer networks</li> <li>○ <b>Other regional ICT in education projects</b> launched by ASEAN and UNESCO to strengthen schools and establish a schoolnet</li> <li>○ UNESCO worked with the government for the project entitled, <b>Promoting the Effective Use of Information and Communication Technologies for Education</b>, to develop a national policy on ICT for education, to train teachers on skills and use of ICTs to improve teaching and to establish a national ICT-based clearinghouse</li> </ul>	
Indonesia	<ul style="list-style-type: none"> <li>▪ Established Indonesian Telematics Coordinating Team (TKTI) in 2000 to harness the use of ICTs for increasing the country's national competitiveness</li> <li>▪ Formulated Presidential Decree No. 6/2001 (Guidelines for the Development and Implementation of ICT in Indonesia) – states the government's general policy towards ICT and calls on TKTI to take an active role to drive ICT implementation for a five-year action plan with the following areas as priorities:</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Ministry of National Education (MONE) conducted several initiatives and programmes to enhance the use of ICT in primary and secondary education: <ul style="list-style-type: none"> <li>○ <b>Education Radio Broadcast for Primary School Students</b> (started in 1991/1992) to enrich learning-teaching process</li> <li>○ <b>IT programme</b> (for vocational secondary schools)</li> <li>○ <b>WANKota</b> (Wide Area Network – CITY) – connecting school LANs within and between cities using wireless connection</li> <li>○ <b>ICT block grants for secondary schools</b> – procurement of computer facilities for the schools</li> <li>○ <b>SMU2000</b> or School 2000 – provision of Internet connections to primary and secondary schools</li> <li>○ <b>E-dukasi</b> or E-ducation project of PUSTEKKOM</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ The Directorate General of Primary and Secondary Education (DGPSE) in collaboration with MONE's PUSTEKKOM trained high school teachers on computer-assisted learning</li> <li>▪ Since 2001, the Directorate of Technical and Vocational Education (DTVE) provided training for teachers in ICT use, graphic design, sound, video, storyboard and the tools and peripherals for multimedia acquisition, presentation and production</li> <li>▪ In 2001, basic computer training for teachers (public</li> </ul>

	<p>Collaboration between the ICT industry and ICT educational institutions; Development and implementation of ICT curricula; Use of ICT as an essential part of the curricula and learning tools in schools, universities and training centers; Establishment of distance education programmes (using the Internet to facilitate teaching and learning)</p>	<p>– to improve the quality of education in high and vocational schools through the use of Internet-based learning materials</p> <ul style="list-style-type: none"> <li>○ Various institutions also conducted ICT-related activities to raise greater awareness of ICT and its advantages</li> </ul>	<p>and private) was provided by APEC Cyber Education Network; then in 2002, the National Office for Educational Research and Development provided training on web design, home page development, web database and e-learning application</p> <ul style="list-style-type: none"> <li>▪ SEAMOLEC conducted various non-formal ICT-related training programs</li> </ul>
Lao PDR	<ul style="list-style-type: none"> <li>▪ The Ministry of Communication, Transport, Post, and Construction (MCTPC) is responsible for national telecommunications policies and regulation; MCTPC with JICA's support developed a Telecommunications Master Plan for 2003-2015</li> <li>▪ The Science, Technology, and Environment Agency (STEA) – in charge of IT policies and programmes; in 1996, developed a national plan for IT with three main projects - the creation of a Lao code page, software standards and a government intranet, ended in 2000 with goals still to be realized</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>The Jhai Foundation and Schools Online established Internet Learning Center (ILC)</b> – set up computers in a renovated classroom and provide computer training for teachers and students; open for public and business use after school hours</li> <li>▪ <b>ASEAN and UNESCO launched regional ICT in education projects</b> to strengthen ICT in schools and establish schoolnet</li> <li>▪ <b>The European Commission under its Asia IT&amp;C Program</b> started a project to apply European Union developments in digital media technologies to improve the quality of education administration and delivery in Asia with a focus on vocational, technical and general education</li> <li>▪ STEA, with assistance from UNESCO and Center of International Cooperation and Computerization of Japan, established an IT Training Center to provide system administration and advanced IT courses for engineers, basic IT skills development training to STEA branch officers and general</li> </ul>	<ul style="list-style-type: none"> <li>▪ SEAMEO INNOTECH provided training for Laos in 2002 in the Philippines (Technology Applications in Education: Teachers and Teacher Trainers)</li> <li>▪ The private sector plays an increasing role in providing ICT-related training on general computing, typing, Internet introduction, computer hardware, database, programming and computer-aided design</li> </ul>

	<ul style="list-style-type: none"> <li>▪ The National Internet Committee (LANIC), established by the government, formulates and regulates national Internet policies</li> <li>▪ The Ministry of Education (MOE) developed a three-phase master plan for IT development in education: Establishment of ministerial intranet system with links to provincial offices and the National University of Laos; incorporation of ICT content into the secondary and tertiary curriculum; Promotion of distance learning and e-learning through ICT</li> </ul>	training in IT utilization to government officials	
Malaysia	<ul style="list-style-type: none"> <li>▪ The ICT Master Plan (finalized in 2001) calls for sustained, productivity-driven growth, possible only with a technologically literate, critically thinking workforce, prepared to participate fully in the global economy of the 21<sup>st</sup> century</li> <li>▪ The Ministry of Education sees ICT as a tool to revolutionise learning, to produce richer curricula, to enhance pedagogies, to lead to more effective</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Established ICT-enabled “smart schools”</b> through a contract with Malaysian TELEKOM – to introduce technology and deliver education in a better way</li> <li>▪ NGOs involved in the drive to introduce ICT into schools by setting up computer laboratories (in primary and secondary schools)</li> <li>▪ Private sectors developed educational portals such as “my-e-tutor” and “e-tuisyen” to allow people with Internet the option of expanding or acquiring knowledge online, of accessing interactive multimedia tutorials and of developing personalised learning programmes (access to these online courses requires a subscription fee)</li> <li>▪ In non-formal education sector, <b>free ICT training</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ The Malaysian government requires all teachers to take basic information courses in teachers’ college which also provides intensive and continuous ICT training for teachers</li> </ul>

	<p>organisational structures in schools, to produce stronger links between schools and society and to empower learners. Specifically, ICT in education focuses on three major areas:</p>	<p><b>courses for women in Sabah</b> were jointly offered by the federal Ministry of Women and Family Development and Sabah Skills and Technology Centre</p> <ul style="list-style-type: none"> <li>▪ ICT programs and projects focus on three areas: ICT provided to all students so that it is used as an enabler to reduce the digital gap between schools; ICT used in education as a teaching and learning tool, as part of a subject and as a subject by itself; and ICT used to increase productivity, efficiency and effectiveness of the management system</li> </ul>	
Myanmar	<ul style="list-style-type: none"> <li>▪ The government developed a 30-year long-term education plan that incorporates the vision of creating ‘an education system that will generate a learning society capable of facing the challenges of the Knowledge Age’ - ICT, through e-education, appears to be recognised under this plan</li> <li>▪ The Myanmar Education Research Bureau has indicated that the following ICT in non-formal education objectives are included in the national plan: <ul style="list-style-type: none"> <li>○ Increasing education opportunities through the use of ICT in schools and community learning centres (CLCs)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ The Ministry of Education installed multimedia classrooms in more than 400 primary, middle and high schools across the country</li> <li>▪ Established an estimated 480 CLCs across the country to provide non-formal education, continuing education and skills training in response to needs of local communities</li> <li>▪ The government opened at least two New Century Resource Centers (NCRCs) in upper and lower Myanmar to provide continuing learning and research opportunities and to provide access to e-education for the public (ICT-related courses include computerized accounting, Windows 2000, software engineering, network engineering, hardware engineering, a postgraduate diploma in multimedia arts and a diploma in information technologies</li> <li>▪ Malaysia provided assistance to Myanmar to launch a <b>Smart School pilot project</b> which provided computers and Internet connectivity to schools</li> <li>▪ ASEAN and UNESCO undertook regional</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Central Institute of Civil Service offered training on the use of multimedia equipment for the basic education teachers</li> <li>▪ The Sasakawa Peace Foundation of Japan also funded training programmes on ICT in education for educators and technicians in Myanmar</li> <li>▪ SEAMEO INNOTECH provided training for Myanmar in 2002 in the Philippines (Technology Applications in Education: Teachers and Teacher Trainers)</li> <li>▪ The private sectors also conducted ICT-related trainings on word processing, computer</li> </ul>

	<ul style="list-style-type: none"> <li>○ Increasing the production of audiovisual and multimedia teaching materials for schools and CLCs; and</li> <li>○ Retraining instructors for effective use of ICT</li> </ul>	<p>education projects in ICT and established a schoolnet; Regional UNESCO projects include improving management and delivery of technical and vocational education through the application of ICTs, promoting successful policy models and strategies of integration within Asia and Pacific region, and using ICT for non-formal education</p>	<p>programming, desktop publishing and graphic design</p>
Philippines	<ul style="list-style-type: none"> <li>▪ The Philippine government believes that to foster lifelong learning skills in learners, educational development with principal focus on quality and access should form the core of its ICT programme. ICT plan of the country aims to: <ul style="list-style-type: none"> <li>○ Provide physical infrastructure and technical support that makes ICT accessible and useful to students, teachers, administrators and support staff;</li> <li>○ Develop competence in using technology, in designing, producing, and using ICT-based instructional materials;</li> <li>○ Ensure access to the latest developments in ICT and to support research and development;</li> <li>○ Undertake a curriculum improvement programme focused on the integration</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ The <b>DepEd Modernization Programme</b> – began in 1996, involves the introduction and use of modern technology to improve teaching and learning, educational management and support operations in the educational system</li> <li>▪ <b>DepEd Computerization Program</b> (secondary level)– in 1999 and 2000, provided networking among schools, access to the Internet and capability for electronic instruction</li> <li>▪ <b>PCs for Public Schools Project (PCPS)</b> – funded through a grant by the Government Japan through the initiative of Department of Trade and Industry by providing 996 public secondary schools across the country the following: n20 desktop computers; 2 printers; fax/data/voice external modem with cable; software package; and, teacher training</li> <li>▪ The <b>Science Education Institute (SEI)</b> of the Department of Science and Technology – provided Mobile IT Classrooms, ICT Mediated Science &amp; Technology Learning Programs, Mini-Computer Laboratories and development of Computer-based Teaching modules</li> <li>▪ The <b>Bridgeit Programme</b> (elementary level) – locally called ‘text2teach’, is part of the global Bridgeit Programme, which delivers digital learning materials to schools using mobile</li> </ul>	<ul style="list-style-type: none"> <li>▪ SEI offered intensive training on electronics and assembly of computers to THE teachers of the 110 S&amp;T-oriented high schools and other special science high schools</li> <li>▪ Since 1997, the Department of Education provided training on use of computers in classroom management and instruction to teachers of English, Science, Mathematics and THE and school administrators</li> <li>▪ <b>IntelTeach to the Future</b> (launched in 2000 in 30 countries) is a worldwide effort to help both experienced teachers and Pre-Service teachers integrate technology into instruction to develop students' higher-level thinking skills and enhance learning. Participating</li> </ul>

	<p>of technology; and</p> <ul style="list-style-type: none"> <li>○ Promote the use of appropriate and innovative technologies in education and training</li> <li>▪ The <b>Adopt a School Act of 1998</b> (R.A. 8525) – to generate private sector participation in the upgrading and modernisation of public schools; with four components - curriculum improvement, teacher training, courseware development and procurement of hardware and software</li> </ul>	<p>technology (specifically for Grades 5 and 6 students in selected public and private schools)</p> <ul style="list-style-type: none"> <li>▪ <b>Development of multimedia packages with ABS-CBN Foundation, Inc.</b> – produced videotapes profiling outstanding instructional practices in English, Science and Mathematics</li> <li>▪ <b>Computer Education for Elementary Schools (CEDES)</b></li> <li>▪ <b>Eskuela ng Bayan Project</b> (elementary level) – provides access to educational materials in English, Filipino, Mathematics and Science and Internet access and links to educational websites</li> <li>▪ A Project to integrate ICT in the 2002 Basic Education Curriculum, in collaboration with UP-NISMED, developed a framework for ICT integration in Science and Mathematics for Kindergarten to Grade 10. (elementary and secondary levels)</li> <li>▪ <b>Establishment of Information Technology Centers</b> (elementary level) – to focus on the needs of a greater number of learners; teacher training will also be a component</li> <li>▪ <b>Project LINK</b> (secondary level) – scheduled to be operationalized in 2003 to provide technology access and development and teacher training</li> <li>▪ <b>Sci-DaMath Competition</b> (secondary level) – annual competition in sustaining Science and Mathematics education through drama activities</li> <li>▪ <b>e-MAGE 2000</b> (Math Games for Excellence for secondary level) – collaborative intervention with private sector to enhance the teaching skills of math trainers through the use of IT</li> <li>▪ As part of <b>Coca-Cola’s e-learning initiative</b> rolling out in countries all over the Asia-Pacific</li> </ul>	<p>teachers receive extensive instruction and resources to promote effective technology use in the classroom.</p> <ul style="list-style-type: none"> <li>▪ Training of robotics and the use of advanced ICT facilities in Physics for physics teachers provided by SEI under the supervision of the Department of Education</li> <li>▪ Training programmes on the use of graphic calculators for Mathematics and Calculus for Science and Mathematics teachers in public schools through the initiative of Mathematics Association of Teacher Education Institutions (MATHTED)</li> <li>▪ <b>Continuing Studies Via Television (CONSTEL)</b> for English and Science teachers – videotapes (tele-lessons) for English and Science teaching produced and distributed by Foundation for Upgrading the Standard of Education (FUSE)</li> <li>▪ <b>Intel Teach to the Future</b> is a worldwide effort to help</li> </ul>
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		<p>region, the company has partnered with the Foundation for Information Technology Education and Development (FIT-ED) to establish 15 state-of-the-art, Internet-connected computer centres in remote public schools across the Philippines</p> <ul style="list-style-type: none"> <li>▪ SEAMEO INNOTECH Projects: <ul style="list-style-type: none"> <li>○ <b>COMPETE</b> (Competency-Based Continuing Education Program for Teachers Utilizing Distance Education Technologies and Materials) designed, developed and tried out a competency-based continuing education program for teachers utilizing distance learning as a mode of delivery</li> <li>○ <b>VIDEOTECH</b> developed a video-based interactive instructional package for teacher education on “The Art of Questioning” and “Reacting Techniques” (funded by USAID)</li> <li>○ <b>TAO LEADS</b> (Teacher Advancement for Optimum Well-Being Leadership for Effective Administration of Schools) – a series of courses that updates educational personnel from school principals to regional directors on current thinking in educational leadership and management, with content that is heavy on the application of new technologies for school administration</li> </ul> </li> </ul>	<p>both experienced teachers and Pre-Service teachers integrate technology into instruction to develop students' higher-level thinking skills and enhance learning.</p> <ul style="list-style-type: none"> <li>▪ <b>Development of ICT-based Learning Materials on HIV/AIDS Preventive Education.</b> With funding from JICA (Japanese International Cooperation Agency), SEAMEO INNOTECH conducted teacher training that aims to: Learn how to use ICT in education/teaching/ learning; Develop skills in training on ICT and computer applications; Develop effective teaching and learning strategies that utilize ICT to enhance &amp; improve students' learning; Improve professional training; Promote inclusive education through ICT</li> </ul>
Singapore	<ul style="list-style-type: none"> <li>▪ First Masterplan (launched in 1997) –the underlying rationale was that students needed to acquire skills such as the ability to think independently and creatively,</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Integration of IT</b> into the content to create a dynamic and flexible curriculum</li> <li>▪ <b>IT competitions</b> (local and international)</li> <li>▪ <b>Collaborative Centre</b> <ul style="list-style-type: none"> <li>○ School-School Collaboration – to engage students in collaborative projects</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Training of pre-service teachers to use technology in the classroom (a fairly comprehensive approach to training faculty and student teachers – providing both</li> </ul>

	<p>to be competent and confident problem-solvers, and to be life-long learners; the use of IT was seen as a means of preparing students with such skills, and it would thus be important to equip schools and teachers with the necessary infrastructure</p> <ul style="list-style-type: none"> <li>▪ Second Masterplan (dubbed as mp2 &amp; unveiled in July 2002) – aims to build on what has been achieved in the first, and bring the use of IT in Education to greater heights; all the key pieces – curriculum, assessment, instruction, professional development, and culture of the school are integrated and addressed; adopts a systematic and holistic approach which calls for the involvement of the major stakeholders in education and emphasizes that they work together to tap IT potentials</li> </ul>	<ul style="list-style-type: none"> <li>○ School-Industry Collaboration - schools have the opportunity to use new technology products to make learning more engaging and authentic for pupils; industries can use schools as test-beds for the use of technology in education.</li> <li>▪ <b>edu.QUEST</b> – an initiative of the Ministry of Education, Singapore. It is a platform where Singapore will showcase research projects on the use of technology in education. Projects in edu.QUEST will focus on quality research into the impact of leading edge technologies on educational practices and achievements. We will share many creative and innovative ideas on the use of Information and Communication Technology which we hope will inspire teaching and learning in schools</li> </ul>	<p>groups with support to make this transition)</p>
Thailand	<ul style="list-style-type: none"> <li>▪ The government recognizes the importance of ICT for achieving broader and social economic objectives. The National ICT Plan of the country has three agendas: <ul style="list-style-type: none"> <li>○ To invest in an equitable</li> </ul> </li> </ul>	<p><u>Major initiatives:</u></p> <ul style="list-style-type: none"> <li>▪ <b>SchoolNet</b> – started in 1995 and provided Internet access to schools and promoted the use of Internet in teaching and learning</li> <li>▪ <b>A tele-education project</b> for non-formal education sector via Thaicom satellite and run by the Department of Non-Formal Education</li> </ul>	<ul style="list-style-type: none"> <li>▪ ICT training on Microsoft Office, Visaul Basic, Power Builder, FOXPRO, MsAccess, SQL, HTML, CAI and Internet have been available depending on the needs of the training group</li> </ul>

	<p>information infrastructure to empower human ability and to enhance life quality;</p> <ul style="list-style-type: none"> <li>○ To invest in people to build a literate populace and an adequate information technology manpower base; and</li> <li>○ To invest for good governance</li> </ul> <p>▪ The National ICT plan specifically states that IT needs to be an integral tool in education and training at all levels, and must not be restricted to science and technology but must include humanities and the arts</p>	<ul style="list-style-type: none"> <li>▪ <b>The UniNet Project</b>, under the Ministry of Education, connects public universities via a high-speed fibre-optic network providing teleconferencing facilities among campuses throughout the country</li> <li>▪ <b>The Information Technology Project</b>, under the initiatives of HRH Princess Mahachakri Sirindhorn, has been working at a grassroots level to develop lessons for the sector as a whole</li> <li>▪ Other projects underway include a <b>donation programme</b> for used computers, ICTs for people with disabilities, multimedia for young hospital patients, ICT for cultural promotion and also ICT training for prison inmates</li> <li>▪ Efforts made by NGOs to utilize ICT in the non-formal sector and to harness the power of modern computer communications and broadcast technologies to create an education system that eliminates traditional communication barriers by establishing a connection between remote villages and the rest of the world using a satellite dish: <ul style="list-style-type: none"> <li>○ The <b>Youth Network</b> – aims to restore youth pride in tribal identity while giving them a support network and helping them adapt to adulthood in modern Thailand</li> <li>○ The <b>virtual museum of hill tribes</b> – to preserve the culture of the six major tribes and to show it to younger generations and outsiders</li> <li>○ The <b>development of ebanok</b>, a web commerce site that is designed to sell handcrafted products made by hill tribal community members</li> <li>○ The <b>creation of Bannok TV</b> – to help fill the need for positive media images of hill tribe people and to provide information forum capable</li> </ul> </li> </ul>	
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		of reaching remote villages	
Viet Nam	<ul style="list-style-type: none"> <li>▪ The ICT Master Plan of the country focuses on meeting the demand for ICT human resources; educational reform in content, teaching and learning methods; study modes; and educational management</li> <li>▪ The Master Plan (2001-2005) also aims to develop a computer-based information network system for education and to improve computer ratios at educational institutions (every school is expected to have at least one classroom with five computers). The objectives for IT development are as follows: <ul style="list-style-type: none"> <li>○ To build ICT infrastructure for education and training;</li> <li>○ To develop ICT human resource sector by preparing up to 25,000 to 30,000 trained specialists at all levels of qualification</li> <li>○ To use ICT as a tool to promote innovative thinking, initiatives, communication, independent problem-solving skills, information searching and processing</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Canada, Australia and Japan provide assistance to improve ICT facilities in Vietnamese universities and scholarships for Vietnamese students</li> <li>▪ The Institute of Francophone Informatics (French) offers a master's programme in ICT for 25 students every year</li> <li>▪ Some foreign information technology companies set up ICT training centres</li> <li>▪ Apple, Microsystem, HP IBM, COMPAQ and Coca Cola offers assistance to Viet Nam education, including setting up ICT training centres and conducting ICT-related training</li> <li>▪ The World Bank and Asian Development Bank gave financial assistance to improve ICT facilities in universities, colleges and provincial education departments</li> <li>▪ <b>EduNet</b> (an educational network) has been designed to link all universities, colleges and provincial departments of education and Ministry of Education and Training (MOET)</li> <li>▪ Development of an inter-linked network of learning centres in secondary schools and youth centres across Viet Nam known as the Coca-Cola Learning Centres</li> <li>▪ Development of a CD-ROM containing information on citizen's rights called "Your Lawyer" by the Office of the National Assembly (ONA) – to educate people about law and order and to make Viet Nam's laws accessible in simple language</li> <li>▪ Other projects aimed at: <ul style="list-style-type: none"> <li>○ Developing, collecting and adopting educational software;</li> <li>○ Enhancing the development of databases for</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Since 1990, various ICT training programmes have been set up to meet the increasing need for ICT teachers</li> </ul>

	<p>skills to facilitate lifelong learning for all people</p> <ul style="list-style-type: none"> <li>○ To build suitable curricula, teaching methods and student evaluation systems for teacher training programmes and to revamp educational management through student, teachers and educational institutions databases as well as legal and regulation documents</li> <li>○ To reach the goal of at least 25,000 trained ICT specialists by 2005</li> </ul>	<p>educational management;</p> <ul style="list-style-type: none"> <li>○ Enhancing ICT training programmes for teachers;</li> <li>○ Creating schools with good ICT application in teaching and management;</li> <li>○ Providing high-quality training programmes for ICT lecturers and researchers; and</li> <li>○ Building joint ICT schools or colleges for ICT training</li> </ul>	
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In June 2003, the UNESCO Asia and Pacific Regional Bureau for Education held the *Experts Meeting on Teachers/Facilitators Training in Technology-Pedagogy Integration* which was able to arrive at a comprehensive profile of teacher training on ICT use in education in Asia and the Pacific.<sup>2</sup> In general, these teacher training activities are implemented either by the government alone or in partnerships with other government agencies or organizations, non-government organizations, the private sector and/or international community with the following goals:

- to support the government ICT for education policy;
- to develop/upgrade knowledge and skills in basic computer literacy and integrated use of ICT in teaching;
- to achieve any or a combination of the three general aims of competency development on (a) basic computer literacy, (b) use of ICT hardware and software, and (c) effective use of ICT for improving pedagogy in teaching different subject areas, classroom management and in telecollaboration and online school activities;
- to realize the importance of developing teachers' skills in computer configuration and troubleshooting
- to gain skills in undertaking online collaboration with strong connectivity to reach different communities; and
- to provide technical advice and support

Most of the training programmes are oriented toward in-service teachers but a growing number of them are also providing pre-service training. For instance, in Singapore, pre-service teacher training on ICT has been integrated in various undergraduate and graduate studies. Many online training courses are also open to the general public.

Teachers are trained at all school levels (primary, secondary & tertiary). But due to some funding limitations, training at the secondary level is given priority in many of the developing countries while advanced countries such as Singapore give trainings in all levels at the same time.

The number of teachers who have undergone training varies greatly from one country to another – from a thousand teachers a year to as much as more than 200,000 per year. Trained teachers are also instructed to echo out the training they received to reach more teachers that will have the chance to be knowledgeable in ICT. Location of training is usually in the country capitals or major cities in selected provinces/regions of the country. Duration of the training also varies from one country to another. It usually ranges from one week to two weeks depending on the needs of the participants.

Most of the trainers come from outside the organizations; they are usually from funding agencies, from universities of technology, from training centres and experts invited from various organizations. In-house trainers also run the training

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<sup>2</sup> UNESCO (2003). *Teacher Training on ICT Use in Education in Asia and the Pacific: Overview from Selected Countries*. UNESCO Asia and Pacific Regional Bureau for Education.

courses. Some training programmes also make use of the peer approach type of training, thereby mobilizing local skills across the country in disseminating ICT skills among teachers.

Many training programmes have been initiated by international organizations, individual national development agencies and technology industry leaders. Some of these sponsors/donors of teacher training on ICT include Intel with Microsoft, Coca-Cola, IBM, World Links, World Bank, Bellanet, UNDP, Japanese Funds and JICA. Governments of more advanced countries also allocate large portion of funds for their trainings.

Most of the countries are also able to produce modules and materials for use in training teachers and other education professionals. The content focus of the training also varies from country to country and from one group to another. The three main trends in content focus are as follows:

1. Basic computer literacy, dealing with hardware and software/applications without necessarily being connected to teaching and learning – basic computer parts and functions; operating systems; software applications – MSOffice applications(not necessarily linked to teaching/learning), which include word processing (MSWord), spreadsheets (MSExcel), presentations (MSPowerPoint); website; navigation and internet searching (Internet Explorer, Netscape); e-mail (MSOutlook, Eudora, Pegasus, etc. ), website development/designing (FrontPage, Dreamweaver); graphics and drawing (Paint Shop Pro, PhotoDraw, Adobe Illustrator, Inspiration); databases, data entry, programming (MSAccess, Pascal, Coldfusion); desktop publishing (Publisher, PageMaker, etc.); designing print materials; scanning text and graphics; video production and editing; chatting, discussion groups (ICQ)
2. Basic computer literacy in support of teaching and learning activities – the same topics under category one are also given but are more linked to teaching and learning. Some of these course contents are: creating student reports in Word, Access and others; using Excel to create class list, for record-keeping, assessment; creating animations for integration into art studies; using WebQuests; using PowerPoint for presentations in classroom for varied curriculum areas; using NetMeeting in the classroom (including use of chat, whiteboard sharing, files, cameras & microphones); file management for teachers for creating folders, moving files, renaming files, etc. for their assignments and documents; using Publisher software to create class newsletter; using FrontPage/Dreamweaver to create classroom webpage for teaching/learning (web publishing in the classroom); using Internet for online resesarch in relation to teaching/learning; effective searching strategies and techniques; using e-mail for telecollaboration; developing productivity tools like templates, tests, mark sheets; creating multimedia presentations for teaching a lesson.
3. Contents Points that integrate the use of ICT and pedagogy – ICT and pedagogy integration (instructional technology and use in various models of

teaching/learning as well as design and principles for integration into subject curriculum and classrooms); integrating ICT into teaching specific subjects; use of online communication tools; technology management and installation; linking schools with the community

The training programmes are generally conducted on a face-to-face mode (hands-on type of training) while a few use both face-to-face and online modes. Online training courses are usually handled by commercial companies and educational foundations on the Internet. Different teaching methodologies are utilized in the training. The more common types are the lectures/presentations, discussions, group work/activities, computer hands-on and practicum. Other strategies also include project-based learning with teachers working in teams, constructivist learning approaches, simulations, hands-on experience with technologies, demonstration, peer discussion, brainstorming, collaboration and joint planning.

## **6.0 Considerations on the Use of ICT for Educational Development**

Amidst the changes in the learning landscape, technology is emerging as a primary artery of delivering education to the learners of the formal and non-formal sectors. There are a number of dimensions which need to be considered in the planning and implementation of ICT-assisted delivery systems in the countries of Southeast Asia.

**6.1 Capacity-building and Retooling of Educators.** Educators need to upgrade their competencies on the nature, scope and use of ICT for education. The knowledge and skills that are needed in the present-day realities are quite different from those in the past. This need is further underscored because of quality issues, particularly achievement and content

**6.2 Creating Environments for the Learner Who Is His Own Teacher.** The learning environment in Southeast Asian countries needs to respond to the learner's unique requirements. The use of ICT in open and distance learning strategies are recognized as having high potentials in creating borderless learning environments wherein geographical boundaries do not pose barriers to learning.

**6.3 Stimulating Research and Benchmarking.** The newer learning strategies anchored on ICT need to be continuously evaluated by educators. These assessment efforts can provide information which would serve as inputs to scaling up, refinement, or even disengagement moves if the programmes.

**6.4 Partnerships and Sharing of Resources.** Collective efforts towards sharing and partnerships are in order, particularly along: knowledge/strategies, expertise, human resources and experiences. Given the enormous complexity of the problems that Southeast societies have to face, particularly globalization, the inequalities between and within countries, *learning to live together*, a concept created by the International Commission for the 21<sup>st</sup> Century, has become a necessity of all the countries of Southeast Asia.

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