

UNESCO Implemented
*Strengthening ICT in Schools and SchoolNet Project
in ASEAN Setting*

Supported by **Japanese Funds-in-Trust**

Report of the

South-East Asian ICT Advocacy and Planning Workshop

for Policy-Makers and National ICT Coordinators
15 December 2003

and

the Sub-Regional Meeting of
National ICT Coordinators on

Project Planning and Management

16-18 December 2003



United Nations Educational, Scientific and Cultural Organization
UNESCO Bangkok

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Bangkok: UNESCO, Bangkok, 2004.

54 p.

UNESCO implemented “Strengthening ICT in Schools and SchoolNet
Project in ASEAN Setting”

1. ICT. 2. Computer uses in education. 3. Information technology.
4. Communication technology. 5. Educational systems. 6. SchoolNet.

371.334678

ISBN 92-9223-026-3

© UNESCO 2004

Published by the
UNESCO Asia and Pacific Regional Bureau for Education
P.O. Box 967, Prakanong Post Office
Bangkok 10110. Thailand

Printed in Thailand

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ACEN	APEC Cyber Education Network
ADSL	Short for Asymmetric Digital Subscriber Line, a new technology that allows more data to be sent over existing copper telephone lines
ASEAN	Association of South-East Asian Nations
BEC	Basic Education Curriculum (Philippines)
CAI	Computer Assisted Instruction
CAT	Communications Authority of Thailand
Centrex	Centres of Excellence (Philippines)
CLMV	Cambodia, Lao PDR, Myanmar and Viet Nam
DPST	Development and Promotion of Science and Technology Talent Project (Thailand)
EMIS	Educational Management Information System
FIT-ED	Foundation for Information Technology Education and Development (Philippines)
ICT	Information Communications Technology; the term used to describe the tools and the processes to access, retrieve, store, organise, manipulate, produce, present and exchange information by electronic and other automated means
ICT4D	Information Communications Technology for Development
IDRC	International Development Research Council
IPR	Intellectual Property Rights
IPST	The Institute for the Promotion of Teaching Science and Technology (http://www.ipst.ac.th)
ISP	Internet Service Provider, a company that provides access to the Internet
KBP	Kilobits per second, a measure of data transfer speed
KU	Kasetsart University (Thailand)
MICT	Ministry of Information and Communication Technology (Thailand)
MOE	Ministry of Education
MOIC	Ministry of Information and Communication (Indonesia)
NECTEC	National Electronic and Computer Technology Centre (Thailand)
NGO	Non-Governmental Organization
NUOL	National University of Lao PDR
ODODS	One District, One Dreamed School Project (Thailand)

Project Background

The project “Strengthening ICT in Schools and SchoolNet Project in ASEAN Setting”, funded by the Japanese Funds-in-Trust, is an attempt to demonstrate that the use of ICT in education will make a difference in improving the teaching and learning process through the systematic integration of the use of ICT into existing educational curricula on science, maths and language. This project was proposed and approved because of lacks and weaknesses still existing in the use of ICT in education in the region. For example, much of the current use of ICT in the classroom still focuses on the drill and practice type of learning, where computers are seen as tutors rather than as tools towards engaging students in critical and interactive learning. Moreover, inadequate basic infrastructure, lack of connectivity, hardware and software and high Internet fees remain some of the biggest problems identified by the ASEAN countries which need to be resolved. Lack of technical support, funds for operation and maintenance and even lack of space to locate computers also pose practical obstacles to ICT use. Though in some countries teachers have been trained in the use of ICT and SchoolNet, the integration of ICT in the teaching of subjects has been weak because of a number of reasons:

- a) absence of systematic management support;
- b) lack of ownership by schools;
- c) lack of integration into existing curriculum and textbooks;
- d) teacher overload and lack of incentives and motivation;
- e) lack of ICT-based materials that are truly interactive for teachers to use; and
- f) shortage of personnel.

An initial survey showed wide ranging initiatives to introduce ICT in schools in South-East Asian countries. These efforts are found in varying degrees within the ASEAN bloc. Countries such as Thailand, Malaysia, Philippines and Indonesia have started far ahead of others, like the CLMV countries (Cambodia, Lao PDR, Myanmar and Viet Nam). Numerous initiatives and projects from various funding sources such as World Links, UNDP, SEAMEO, Intel, IBM, Coca Cola and the International Development Research Council (IDRC) are currently taking place in Cambodia, Lao PDR, Indonesia, Malaysia, Philippines, Thailand and Viet Nam, both in the areas of teacher training and in ICT use in classrooms. There is a need to learn from each other and from the more advanced countries in terms of ICT use in education. Countries like Australia, New Zealand, South Korea, Japan, India, Malaysia, Philippines and Thailand have already launched SchoolNets to connect the schools to the wealth of educational sources and resources available. These countries can share innovative teaching and learning materials and best practices online.

Part
1

Introduction

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Providing the foundation for implementing the launching of the project entitled, “Strengthening ICT in Schools and SchoolNet Project in ASEAN Setting”, UNESCO organised the South-East Asian ICT Advocacy and Planning Workshop for Policy Makers and National ICT Coordinators on 15 December 2003. Project organizers realized that it was only through the official commitment and support of the High Officials from the Ministries of Education in the eight South-East Asian countries involved that the goals and objectives of the Project could be achieved, so the Workshop sought to obtain their commitment to pilot testing the Project for three years.

Working towards this goal, the Workshop was designed to help participants develop a better understanding of the goals, objectives and strategies of the Project and how the Project will contribute towards enhancing the existing ICT in education programmes of their countries. The many presentations helped to raise better awareness of the lessons learned, best practices, and innovative strategies that exist on the integrated use of ICT in education, and in setting up or improving on SchoolNet operations, as well as how each country can contribute towards the development of a South-East Asian SchoolNet. Gathering the high officials of the region together also provided natural opportunities to explore ways and means for establishing more systematic and coordinated collaboration and networking in the Project implementation.

The key participants to this one-day meeting were the same high officials who were attending the *SEAMEO High Officials Meeting* from 16-17 December 2003. These representatives were also the members of the *High Officials Network* of the *SEAMEO Secretariat*, and were considered crucial as they are in a position to influence decision-making. The Workshop was also attended by eight national teams comprising of the coordinator and those responsible for the ICT Unit, SchoolNet, and the curriculum development of science, maths and language in the Ministry of Education of each country.

As well as offering an introduction to the Project and its supporters and organizers (SEAMEO, UNESCO, Japanese Funds-in-Trust (JFIT) and the ASEAN Foundation), presentations and discussions worked towards establishing the official cooperation and commitment from the South-East Asian Countries. A chief target was their endorsement of the integration of ICT into the curriculum of science, maths and language and to identify the mechanisms and strategy for ensuring this integration.

The national teams who will implement the Project were detailed, the three pilot schools identified, and future activities discussed, before the official signing of a Memorandum of Agreement to seal all countries' official commitment and support to the Project.

During the next three days, the national teams went on to participate in the Sub-Regional Meeting of National ICT Coordinators on Project Planning and Management. To follow up on the decisions and agreements made during the Policy-Makers' Workshop on the previous day, this Meeting fleshed out and detailed the Memorandum of Agreement and the set of recommendations arrived at into a master plan/work plan for implementation at the national level (see Appendix 3).

The ICT Coordinators participating in this Meeting translated the commitment made by their policy-makers into an actual set of activities in order to pave the way for the implementation in their respective countries. More specifically, the Meeting was organised to develop the national master plan, which should provide details on the rationale, objectives, organizational framework, country team members and responsibilities of each member, working policies and mechanisms, strategies and activities, work plan and timetable, and the budget required, amongst other pertinent details. Another objective was to develop a general curricular framework or scope and sequence identifying entry points in science, maths and language curriculum for introducing ICT-based lessons and teaching and learning materials at the secondary level. The Meeting also served to identify existing lessons, educational software and ICT-based teaching and learning materials already available at the country level for teaching science, maths and language which can be utilized for the Project, as well as identifying the pilot schools and defining the terms of reference for joining, criteria for selection, location, and requirements. Finally, the Meeting sort to map out future activities and mechanisms for collaboration and reporting.

During the Meeting, the participants gave their country presentations on the current status of ICTs in Education and SchoolNets in their countries. There were also presentations from partners, donor agencies, and other stakeholders, which focused on how they could assist the Project. Many practical sessions were organised for participants to work in groups and discuss issues of project planning and management, to develop their master plans and identify entry points in science, maths and language curriculum. The groups also discussed the details of the involvement of the pilot schools, detailing the terms of reference, the requirements, locations, and how they would evaluate activities. Finally, all participants got together to discuss where to go from here.

Part
2

Synthesis of Experiences in South-East Asia in the Integration of ICT into Education Systems: Lessons Learned

Based on the experiences of six countries in the region (Malaysia, Indonesia, Singapore, the Republic of Korea, the Philippines and Thailand) in using ICTs for education

By Lim Cher Ping

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Eight Components - Key Foundation and Framework

I. Broader Development Context

1. Educational system responsiveness

- A well-planned and responsive education system provides an appropriate enabling environment for the successful implementation of ICT in education policy and programme.
- To make ICT an integral part of education and ensure programme support, the ICT in education vision/programme should be integrated as part of the overall policy.

2. ICT in education policy and ICT infrastructure support

- An ICT in education policy should be driven by a vision which can be translated into action targeted at realistic and manageable goals.
- We must take a holistic approach that goes beyond a technological dimension.
- Adequate physical and technological infrastructure is necessary.

3. Economic and social/cultural context

- A well-developed ICT infrastructure in the economic sector facilitates successful implementation of ICT in education policy.
- ICT in education policy is one of several key economic strategies to ensure sustained economic development of any country.

II. Policy and Regulatory Environment

1. Policy development

- The ministry of education should work closely with other government organizations, especially those in charge of implementing national policies on ICT and telecommunications.
- Lessons learned from pilot projects and studies provide the basis for further policy expansion.
- Harmonised implementation of ICT in education programmes can be achieved by defining clearly the roles and responsibilities of all departments.

2. Transforming policy into action

- Phased implementation of ICT in education policy ensures that the implementation process is manageable. It also provides opportunities for revision and fine-tuning.
- Central support from the MOE to pursue a clear and measurable vision helps in developing and implementing a comprehensive programme for the capacity building of schools in using ICTs in education; there is a definite need for collaboration, and the central coordination of MOE, but there must be some role for the autonomy of schools.

3. Legal and regulatory framework

- Initial filtering of undesirable websites is necessary.
- Better production is ensured by making education on safety issues pertaining to the Internet an integral part of parenting, as well as of teaching and learning activities.

4. Macro-economic impact

- ICT in education policy should complement other government initiatives, such as public education on ICT, donation of computers and provision of free Internet access.

5. Inter-ministerial collaboration

- Sharing expertise, experiences and infrastructure among ministries and government agencies helps to coordinate and harmonise implementation of programmes.

- Creating a national policy-making, regulatory and implementing agency for ICT development systematises cooperation on ICT.
- Inter-ministerial collaborations could involve private sector participation.

6. *Advocacy and support from policy-makers and other stakeholders*

- By linking the objectives of ICT in education policy with national education objectives, support from policy-makers and other MOE stakeholders could be more forthcoming.
- By making policy-makers and stakeholders regularly aware of and updated on the benefits of ICT to education, based on research results and documentation of experiences, advocacy for the acceptance of ICT use in education is further strengthened
- By making all decisions taken or amended by the MOE's highest steering committee known to all members of the committee and heads of departments, their sense of ownership and involvement is enhanced.

III. Management and Financing

1. *Leadership and management*

- Having a champion at all levels in the education system promotes ICT acceptance.
- Including ICT in education as an important component in the development programme for administrators supports the introduction of innovative use of ICT in schools.

2. *Harmonising ICT in education programmes with other ICT and/or education initiatives/projects*

- To avoid duplication of work and dilution of funds, there should be coordination of ICT in education projects and sharing of information on ICT.

3. *Dichotomy between educators and technologists*

- To ensure that ICT in education projects are not just technology-driven, they should be managed by a team composed of educators and technologists.

4. *Resources at ministerial and school levels*

- To ensure the readiness of all schools, there must be adequate initial financial investment by the government at the national level, especially on infrastructure and resources.
- Every school is different and each one should be given some autonomy to select ICT resources that are most suitable to the needs of students and teachers.
- Investments in ICT infrastructure and resources in schools create an environment that is conducive to learning.
- The MOE should be encouraged to establish a standard budget based on school size and existing resources rather than applying one formula for all schools.

5. Resources from donors and the private sector

- Financial and resources support for the implementation of ICT in education policy is mobilised if school-industry partnership is an integral part of such policy. In addition, schools are able to explore and experience emerging technologies and pedagogies.

6. Strategies to ensure sustainability

- Preparing and disseminating guidelines on how to source funds empower schools to look for their own funds and to identify expertise to promote sustainability.

IV. ICT in Schools – Policy, Vision and Strategies

1. ICT in schools: Vision and plan

- A clear vision of ICT integration in schools that is shared by all members of the school community promotes effective use of ICTs in the classroom.
- An ICT master plan that is formulated according to a school's vision and its socio-cultural setting ensures effective integration of ICT.

2. Supporting policies to facilitate uptake of ICT

- To promote ICT uptake in schools, school leaders should initially adopt strategies that make ICT part of the daily routine or tasks of the teachers.
- To promote use of ICT in schools, the MOE should set guidelines for schools on the integration of ICT in the curriculum, without imposing these as rules or regulations.
- ICT use in schools is more likely to be facilitated if school leaders employ strategies that provide teachers with a platform and support for the integration of ICT in the curriculum.
- Appointing an ICT coordinator or head of ICT department in each school helps to ensure administrative and pedagogical support for the teachers.

3. Management of ICT resources

- Carrying out a SWOT analysis and applying its findings help to optimise the use of ICT resources.

4. Translation of laws into acceptable school-level regulations

- Translating ICT in education policy and laws into a set of school-level regulations and procedures provides a clearer blueprint for schools on the use of ICT.

5. Parents and community involvement

- ICT bridges and strengthens the home-school connection and, if properly harnessed, promotes parents' activities and involvement in the school.
- When parents are encouraged to participate in and contribute to change management activities within a school's master plan, change occurs more quickly.

- As ICT opens opportunities to collaborate with different organizations and people in local and international communities, schools should establish linkages with different communities to help in developing the overall character of students.

V. Technology Infrastructure and Connectivity

1. *Mobilising support from telecommunications and ICT organizations and industries*

- Tapping local telephone companies and ICT industries for support promotes affordable Internet connectivity and computer hardware and software.

2. *Choice and mode of deployment of technologies*

- When deploying technologies to schools throughout the country, establishing a balance between equity and effectiveness is necessary.
- Deploying ICT in different types of pilot schools or demonstration schools will generate lessons on how to increase ICT use at different school levels and cull best practices.

3. *Connectivity options/alternatives*

- Use of satellite and Internet schemes has enabled some countries to reach marginalized areas or economically disadvantaged groups.
- Working closely with Internet Service Providers (ISPs) helps in determining appropriate bandwidth connections in schools and homes.

4. *Infrastructure to support and deliver teaching and learning*

- There is no perfect combination of online and offline resources to promote teaching and learning.
- Digital libraries for schools may be introduced as infrastructure to support and deliver teaching and learning.

5. *Emerging technologies: Dealing with rapid development of technologies*

- ICT pilot projects should not take more than three years to complete since the obsolescence rate of present-day technologies is increasing.
- Mobile computing offers schools many opportunities that include overcoming constraints of space and giving flexibility in anytime-anywhere utilisation of ICT in schools.
- Leasing equipment from private companies can be one solution to the problem of the rapidly increasing obsolescence rate of technologies.

6. *Donation of computers*

- Vocational colleges can be tapped to provide maintenance services for computers donated to schools.
- Donated computers that have exceeded their lifespan may be redeployed for other uses or offered to needy students in other schools, to government organizations or to charities.

7. Open source software

- Although open source software (Linux-SIS, locally-developed word processor and digital toolkit for developing Web content) is encouraged in the schools, there are limitations that must be taken into account before schools decide on its use.

8. Guidelines on information security

- Preparing and disseminating guidelines on ICT security help in dealing with information security problems in schools.

9. Integrating school management software with learning management systems (LMS)

- Maintaining the inter-operability of a common school management system while ensuring that decoupling is built into the system is a need expressed by most countries.
- There should be adequate in-house training to help school staff and students in using LMS and in coping with the transition from manual to automated processes.

VI. Curriculum, Pedagogy and Content Development

1. Integrating technology in the curriculum and assessment

- When teachers perceive ICT as a tool to meet curricular goals, they are more likely to integrate ICT in their lessons.
- Equipping students with ICT skills facilitates its effective use in schools.
- Teachers play a pivotal role in the integration of ICT in the school curriculum and assessment.
- When ICT is introduced into the assessment process, there is a need to reconsider the assessment approaches.

2. Shift in pedagogy as a result of integrating ICT in the curriculum

- Shifting pedagogical approaches to the use of ICT in education is time-consuming.
- Shifting pedagogies, redesigning the curriculum and assessment processes, and providing more autonomy to the schools help to optimise the use of ICT.
- Shifting pedagogical approaches is facilitated through the appropriate professional development of teachers.

3. Contents and services that support continuous improvement of curriculum practices

- Attracting well-established foreign education software developers to work with local companies helps to develop high quality ICT-based resources.
- Establishing a clearing house or digital libraries of ready-to-use and customisable ICT-based resources promotes better use of ICT in teaching.

4. Development and selection of culturally sensitive content

- Having a mechanism in place for evaluating content developed for schools ensures political and cultural validity, reliability and correctness.

5. Ethical and political implications of English being the lingua franca

- While local content in the local language promotes better use of ICT-based resources and materials, the use of English optimises the potential of ICT for teaching and learning.

6. Intellectual property rights related to educational software

- A cost-benefit analysis conducted before deciding on whether to acquire the intellectual property rights to educational materials, or to acquire a perpetual license to use the materials, prevents waste of resources.

VII. Professional Development

1. Policy and management of teacher training on ICT

- To ensure continuous training of teachers from pre-service teacher education to induction to in-service professional development, training agencies should be mobilised and labour divided among them, with the MOE providing central coordination.
- Professional development is more likely to succeed if continuous training of teachers is a built-in process and is offered as a benefit to them.
- A centralised training administration system for all teaching and non-teaching staff is crucial to document and monitor professional development.

2. Teacher training modalities

- Peer and school-based training of teachers ensures that teachers are trained in the context of their workplace.
- Incorporating online learning into professional development on ICT enriches teachers' experience and makes them comfortable with online learning.
- Needs-based just-in-time learning and peer coaching ensure further development of teachers' ICT and pedagogical skills.

3. Teachers' competencies and standards

- ICT competency standards serve as a benchmark for formulating and evaluating teacher training programmes and the use of ICT in teaching.
- Customising national-level ICT competency standards for each school, depending on its socio-cultural context, ensures ICT integration and acceptance.

4. How to change the mindset of teachers

- A buddy system approach where novice teachers work together with expert teachers in a classroom using ICT contributes towards changing prevailing mindsets.

5. Content focus of capacity building for teachers

- Training teachers on ICT-related skills within the context of the classrooms objectives and activities ensures the development of skills in the integrated use of ICT in teaching.
- ICT professional development programmes for teachers should be planned taking into account the ICT vision and policy.

6. Capacity building for education personnel at all levels

- Training education personnel at all levels ensures that all aspects of ICT use in schools are implemented in an efficient, coherent and complementary way.

7. Incentive system and motivational strategies for teachers

- Formal certification of in-service professional development that leads to diplomas or degrees could provide an incentive for teachers to upgrade and update their ICT skills.
- Teachers' interest in using ICT after their training is more likely to grow if they are provided with computers, training materials and software for classroom use.

VIII. Monitoring and Evaluation

1. Documentation of ICT use in education

- Proper use of ICT tools offers students and teachers learning and teaching opportunities and improves teaching and learning processes.
- Investment in research and development projects and centres has contributed towards examining existing pedagogical practices, revising and refining practices, and exploring new pedagogical approaches to ICT in education.
- Research has helped policy-makers to formulate ICT targets and goals.
- Evaluation can demonstrate the reasons for the under-utilisation of ICT resources and identify major obstacles to their full utilisation in schools.

2. Evaluation methodologies

- Action research is one of the best methodologies for documenting the process of effective ICT integration.
- Assessing the learning impact from ICT use is better measured through other means besides the paper-pencil test method.
- To gather the most meaningful data on the integrated use of ICT in schools, both qualitative and quantitative methodologies should be used, employing various data-gathering instruments, such as case studies, questionnaires and face-to-face interviews.

3. Programme evaluation

- Evaluation of the ICT in education programme should be a continuous process, covering planning, implementation, reflection, refinement, effectiveness and user acceptance.
- Due to limited experience in ICT use in the region, better quality directions for the programme can be obtained by benchmarking the quality of ICT projects against international studies, standards and best practices.

(See <http://www.unescobkk.org/education/ict/v2/info.asp?id=16158> for more information)

Part
3

Start-up Toolkit for SchoolNet Operations

Based on the experiences of six countries in the region (Malaysia, Indonesia, Singapore, the Republic of Korea, the Philippines and Thailand) in setting up and running SchoolNets

By Stephen Marquard

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The many debates about whether ICTs can really help learning are now over. One decade ago, people were still asking whether ICTs would improve education or not. Now people are asking questions more like “Where do ICTs fit into the scheme?” not whether they have value. ICTs provide the opportunity to re-engineer education systems. Governments need to consider how people can be educated to use the new ICTs and the new huge pool of information available. ICTs have a very broad application and can be used in many different ways. However, to be successful, they must be integrated with policy-planning and implementation. Strong government backed integration is needed, especially in the areas of content development and in providing access. Indeed, there is a strong equity and economic case to say that governments must ensure access is delivered to all schools. While it is very clear that promise will not be realized until the main population of each country has Internet access, appropriate online content needs to be developed in local languages so there is something worthwhile to connect to. Moreover, the Internet only becomes useful when there is a strong relation to the curriculum; countries will need to invest in developing quality content that is curriculum-aligned.

While access to the Internet is very difficult in some areas, it is most advanced in others. Country resources also vary greatly. There are valuable examples from all countries reflecting very different ways of integrating ICTs. Even the term “SchoolNet” means different things to different people, projects, institutions etc. For this reason, the toolkit is taking an inclusive approach; it is not prescriptive. What do we believe the term SchoolNet represents? What is a SchoolNet to us? For the purposes of this Project, we define the term as representing a service that promotes the development of the Knowledge Society by connecting schools, supporting e-learning in networked environments and more.

With such diversity in country experience and current status, the Start-up Toolkit was designed to be procedural in providing various experiences, rather than saying

what should be done. Laid out in four substantive guidebooks, the kit is targeted especially towards policy- and decision-makers, school managers, practitioners, teachers and principals.

Guidebook One provides a general overview: what are ICTs, the value chain for educational ICTs, what is a successful SchoolNet, how ICTs relate largely to the Internet and computers, and looking at developing a relationship between ICTs and the Knowledge Society. How ICTs have been understood to improve the value and quality of education is also covered here. It is crucial that an integrated approach is taken – only with a jigsaw of elements can we work together to create a powerful effect. This section also looks at ways at the quality of a SchoolNet can be assessed.

Guidebook Two looks at planning a SchoolNet programme, in terms of infrastructure, professional development, online content, curriculum integration etc, as well as ways in which to integrate change management, the sustainability of SchoolNet activities and how can we better institutionalise programmes.

Guidebook Three is more hands-on and practical. It is targeted towards the people actually running the projects – looking at the educational and social value of online communities, technological components, the different ways in which technologies can be adapted etc, providing ISPs, SchoolNet infrastructure and so on.

Guidebook Four is a practitioners' guide, setting out the typical processes which they may follow.

(To download the SchoolNet Toolkit, please see <http://www.unescobkk.org/education/ict/v2/info.asp?id=16282>)

Part
4

Comparative Synthesis of Country Experiences

During the meeting, the countries participating in the project gave presentations on ICT in education and SchoolNets in their countries. In this chapter we compare their experiences in thematic sections.

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Challenges

In Cambodia there are many challenges to the development of e-learning. The Government recognizes the country is at an early stage of integration and thus needs to learn from the experiences of others. Yet even if the country is at just at the first stage, they are willing to implement this Project, in an attempt to narrow the gap of ICTs in schools between Cambodia and other more developed countries. The country also identified costs as a major impediment to ICT use in education, along with the fact that not all schools have electricity. The MOE is investing ways to get around this, and would like to welcome any opportunity to strengthen connectivity.

Indonesia gets around the problem of lack of electricity in schools by using generators and solar power. Yet remaining difficulties include a lack of available computers and modems, and the connection fee is very expensive.

Lao PDR also suffers from some basic infrastructural impediments, with lacks in policy, guidance, curriculum, understanding on how to use ICTs, human resources, budget from the Government, and connectivity. Other constraints include the high cost of Internet connectivity, and a lack of integration of ICTs into existing curricula. There is a need for external assistance to prepare and establish ICT curriculum in secondary schools. Teacher training is also needed, and ICT for Development (ICT4D) is to be made a priority.

Myanmar and the Philippines, on the other hand, both reported a lack of systematic coordination between the various groups involved in implementing ICT projects. The Philippines expressed the difficulty of coordinating their many ICT in education projects as a “tricky juggling act”, since they often have very different objectives. To overcome this, they try to make sure that each project has at least some objectives in line with those of the MOE. The Philippines went on to reveal further challenges as being negative attitudes of principals, inadequacy of facilities and how to maintain the ICT resources. To overcome these difficulties, the Philippine Government is

setting up a systematic development programme for education managers to help win over school principals to ICTs, while tapping other resources to finance ICT expenditure in education. Teachers will also be trained on troubleshooting in coordination with private service providers.

Meanwhile, in Viet Nam obstacles to ICT in education development have been more content related, as school websites tend to be used as electronic journals, and the quality of information on university websites is still very poor. Suggested reasons for this are that schools either want to hide information, or they do not understand the importance of information sharing.

Policy Support and Management

At present, Cambodia has no specific policy regarding ICTs in education, though a policy is currently under development with the assistance of UNESCO.

Meanwhile, in Lao PDR, the Information Technology Master Plan in Education Management has three major components:

- The establishment of a ministerial intranet system with links to provincial education services and the National University of Laos (NUOL) in order to facilitate information collection and processes.
- The incorporation of ICT content into the secondary and tertiary curriculum.
- The promotion of distance learning and e-learning through the newly established intranet system.

Lao PDR plans to integrate all their ICT projects together, and the MOE will be responsible for synchronizing activities.

Myanmar's Education Promotion Programme has 10 programmes under its long term plan, of which one is using ICTs, with the vision of creating "an education system that will generate a learning society capable of facing the challenges of the Knowledge Age." Most efforts under this plan are focused on the non-formal education sector. Myanmar is also a party to the e-ASEAN (Association of South-East Asian Nations) Framework Agreement, and accordingly, the Government has formed a Myanmar e-National Task Force to promote ICT. The Government also established the Myanmar Information and Communication Technology Park in 2001 to promote private sector ICT development.

Similarly, in Indonesia the MOE has made some efforts to collaborate with the private sector. A block grant was provided to be used to accelerate the utilization of ICT for education purposes. To cover hardware lacks, the One School One Computer Laboratory (OSOL) project was established by the Ministry of Information and Communication (MOIC). The private sector has also donated computers and software to schools. In the future, cheap and affordable computers are to be produced for education in schools. An IT Unit has been established within school management to manage and utilize computer-based information for learning needs, including the recently launched edukasi.net.

The Philippines has begun to re-conceptualise the policies and strategies of ICT in education towards life-long learning, in its Information and Communication Technology Plan. With IT involved in education as an enabling and productivity tool that will enhance learner performance, educational efforts are being re-focused

on the requirements of the learners and the job market through ICT. The participation of other stakeholders in education is also sought in the upgrading and modernization of the public schools especially those in the underserved provinces. The Local Government Units (LGUs) shall be increasingly tapped to ensure the sustainability of the ICT programme. The devolution to the LGUs of a reasonable share in the responsibilities in financing the maintenance and operation of the ICT laboratories will also be hastened.

The National Basic Education Curriculum (2001) of Thailand is comprised of eight strands, of which Careers and Technology is one. There are four ICT policies and master plans relating to education. The National ICT Policy from 2001-2010 was devised under the National Electronic and Computer Technology Centre (NECTEC). Next to be developed was the National ICT Master Plan 2002-6, coming out of the Ministry of Information Communications Technology (MICT). The MOE created the ICT Master Plan for Education 2004 - 2006, as well as the ICT Master Plan from 2002-6. The plan recognises that a massive programme to introduce computers, multimedia, and distance education facilities to all state schools is imperative. This drive must be accompanied by the development of suitable courseware specifically designed for electronic delivery.

In Viet Nam, the Master Plan for Information Technology in Education for the Period 2001-2005 outlines the following objectives: To build IT infrastructure for education and training; To develop IT human resource for IT industry for reaching to 25,000 or 30,000 IT trained specialists at all levels of qualification; To use IT as an aided tool to teaching and learning for promoting new skills; To develop IT application to any subject, at any school, at any level through use of educational software; To build suitable curricula, teaching methods and student evaluation systems for teachers' training programmes and to revamp educational management. Viet Nam is also developing a computer-based information network system for education called EduNet and is working towards the target that every school should have at least one classroom with five computers.

Teacher Training

In Cambodia, around 50,000 primary and secondary teachers are getting training. The nation is using ICTs to improve access to their teacher training programme. Meanwhile, in Myanmar 900 teachers have already been PGDMA appointed – (post grad diploma in multimedia arts), with 300 graduates for every year since 1999. Multimedia and Basic Computer Training Courses are also offered.

As for Viet Nam, pre-service training is provided in teacher colleges, and ICT curriculum in-service training is provided for every teacher. Re-training is organised for current teachers. For example, maths teachers are called to university and have to go back for two years for a secondary degree in ICT. The nation has also organised training for content and course developers, administration, and technical staff.

Indonesia also offers pre-service training, whereby teachers-to-be learn by computers in teacher training university/teachers college etc; and in-service training on ICT in conjunction with the provision of an ICT block grant. The teacher training university and teachers colleges offer short courses on ICT for teachers. APEC Cyber Education Network (ACEN) has also provided computer training to senior secondary schools teachers.

Meanwhile, in Malaysia training of school administrators was undertaken by the Aminuddin Baki Institute, the Ministry's staff development centre. In-service and pre-service training courses are conducted by the Teacher Education Division. Interesting to note here is the experience of the Smart School Project, where their main concern was the attitude and willingness of teachers and other parts of the community to support the programme, highlighting the importance of the role of teacher training institutions.

The Philippines conducts pre-service teacher training through their Centres of Excellence (Centrex).

Curriculum and Content

Content development is a vital activity for Edunet Viet Nam, towards which the Prime Minister announced in May 2003 that each university and each school must have a website. Viet Nam believes there should be two steps to their content development: firstly, to see what is already available, recognizing that much of this content will be in English; and secondly, to create effective new content. Examples of what Viet Nam has already done towards developing content include: Students can see the results of their National Exams online; EMIS has been set up; and education forums and e-books developed. Some provinces have created their own websites: for example, www.bacgiang.edu.vn, www.thuathienhue.edu.vn and www.hoabinh.edu.vn. ICT as a subject in its own right covers Windows, Word, Excel, PowerPoint etc. ICTs are also integrated in maths with Geo Cabri software, into science with Crocodile Physics, and into chemistry and technology, all of which have versions online. Vietnamese Linux has been developed, and teachers are using PowerPoint to teach Vietnamese history.

In Indonesia meanwhile, the new curriculum from 2004 includes ICT as a tool to support active learning, and there will be more freedom for teachers to find the best way to help students to learn. ICT has already become part of the maths, science and language curricula, and is also a subject matter in its own right under the new curriculum. PUSTEKKOM has developed Internet-based learning materials for science, maths and language, as uploaded on the edukasi.net website (<http://www.edukasi.net>). Some are available offline and are stored in CD-ROMs. Unlike private sector learning materials, learning materials developed by the MOE are developed through needs analysis, design development and evaluation – in a systematic way, and in line with the curriculum.

Curriculum development in Malaysia is the responsibility of the Curriculum Development Centre. All courseware is being translated into English. As in Indonesia, instructional design was developed in line with curriculum specifications, pedagogy, and learning needs. E-learning portals have also been developed by private companies to provide services and materials for students and teachers. Most of these portals offer drill and practice materials to help students prepare for public examinations and provide services and materials to help teachers and students learn better. As in the UK, each school is allocated a certain amount of money to procure their own educational materials.

The Thai Institute for the Promotion of Teaching and Learning (IPST) Website and SchoolNet Thailand have some good examples of ICT-integrated lesson-plans for science and maths, while the latter site also houses content on language, art and

social studies. Thailand has gone as far as to develop ICT-supported Science and Maths Curriculum Standards, as put in place by IPST (<http://www.ipst.ac.th>). Exemplary ICT, curriculum materials were developed, as well as learning activities using ICT, E-Testing and E-Learning.

The Philippines are currently restructuring the curriculum to integrate the application of ICT in teaching and learning.

ICT in Schools

In Cambodia, while there is currently some multimedia and ICT in schools in educational offices, computers in the classroom have not yet been fully implemented. The number of computers is still very low, with just 1,000 computers in schools and education offices across the whole country. Until 1994, computers were virtually non-existent in schools. ICT started being used in 1997 through the private sector. The Government is trying to provide PCs to each school, but the 1,000 computers are used mostly for administration. The MOE is implementing ICTs in 24 offices, for the use of 3,000 managers, but will later extend to 183 districts and a further 2,000 staff. The nation is also using mobile resources to reach the more disadvantaged areas.

Lao PDR started the implementation of ICT in education with a variety of international funding agencies. Three ethnic minority boarding schools were established with money donated by the Vietnamese Government. Each school has ten computers and textbooks for basic computer skills. As yet these schools lack a connection to the Internet. In addition, two “Smart Schools” were set up with money from the Malaysian Government. Each school has 20 computers, interactive learning software, courseware based on interactivity for self-paced learning, educational software in English, Internet access and one server. The project will shortly be extended to another secondary school. Four Internet Learning Centres were set up with support from the Jhai Foundation. Each centre has ten computers and a manual for basic computer skills in Lao language for students and for teacher training. Internet access is usually at 56KBPs, but is slower in some areas where they have to use dial-up. Grades 9-10 are taught computers. These services will later be extended to another secondary school with funds from World Links. Later the schools will earn their own income from the centres and become sustainable.

In Myanmar, multimedia has been integrated into schools since 1998. The term “multimedia” here includes audio systems using cassette and head-phones, though most have language labs, videos and VCDs, and computers. Almost all secondary schools are installed with multimedia facilities and 100 high schools were connected to the Internet in 2002, with the costs paid for by the State. The cost of connectivity is very high, but the connection is good. Some schools also have a local network. The Institute of Computer Science was established in 1998. In addition, 455 education e-learning centres have been set up, as well as three pilot smart schools, one of which the Malaysian Prime Minister opened in 2002. There is online learning for non-formal education (NFE). Apart from the audio language labs and video equipment available in all primary and secondary schools, computer-assisted instruction (CAI) is conducted in all subjects, though especially in science and maths. Video CDs and computer CDs for interactive learning have been produced and distributed by the Myanmar Educational Research Bureau (MERB), while

professors' lectures on various school subjects are available on VCDs for high school students. Teachers have also tried to develop their own tools.

In Viet Nam, compulsory computer courses were conducted in senior secondary schools from 1993-1997, but these were stopped from 1998-2001 because of a change in policy. The courses were started up again in 2002 in primary and secondary schools. There is also an optional training course at the junior high level. The Government organises an ICT Olympia of Informatics. Other achievements in this area include the development of EMIS online, heralding a new generation of education management. It is hoped that the e-learning system will help move away from traditional education to a more advanced stage, making education available anywhere, anytime for anyone, and providing flexible, lifelong learning and open learning. Content authoring tools have been developed and there has been training for content and course developers, administration, technical staff etc. As for connectivity, some universities have leased lines, while a few schools have ADSL. By the end of 2005, the Government hopes to have connected half of all secondary schools and is also setting up LAN in schools. With the target ratio of 20-30 pupils/PC, 1,000,000 PCs will be needed for the next three years. In the future, each family will have at least one PC. In July 2003, an agreement was signed with an electricity company who want to provide fibre optic connectivity free of charge for all universities for the first year. Since the lines already exist, to put in optic fibres the cost is minimal.

Indonesia has also been busy of late improving infrastructure and connectivity. Rolling grants have been provided to vocational schools to build local area networks and provide Internet connections for 50 schools. City wide area networks have also been established in 18 cities, connecting schools in the cities into a network, under the WANKota project. A block grant has been provided to 248 schools for the utilization of ICT in schools. The Associated Schools Project Network (ASPNet) connects 24 schools associated with the UNESCO Project through the Internet. Many schools have PCs and modems, and the majority of schools in urban areas also have computer lab facilities and computers connected to LAN and the Internet, most often using dial-up. Around 70 per cent of schools have their own website. Awareness is being raised on the importance of integrating ICTs, but it is still limited.

The Malaysian Government believes that ICTs should not be taken only as another subject in the curriculum, but rather as tools which teachers and students may use in the learning environment, as well as in their everyday lives. A pilot project was run in 87 schools using the Smart School management system and integrated components. The project ended in December 2002, so by 2003, all schools were Smart Schools. The roll-out plan has its first phase from 2004-5: 100 million schools will become Smart Schools, and another 200 will become Smart Schools in 2005. Courseware was developed in four subjects, but the SchoolNet pilot will involve five subjects. The infrastructure for Smart Schools in the pilot project is implemented in three levels:

1. the lab model, of fast backbone with a leased line;
2. the limited classroom model; and,
3. the classroom model, with three servers, more computers etc.

The plan is to achieve a ratio of 1:10 of computers to students for the roll-out. Each individual teacher who teaches science and maths in English is provided with a

laptop for lesson planning and actual teaching using the courseware provided. All schools are using the Government as their network provider.

In the Philippines, an education modernization programme is being undertaken to equip schools with facilities, equipment, materials and skills and to introduce new learning/delivery systems necessary to capitalize on recent technological developments. Over 64 per cent of high schools have a PC lab with 10-20 computers - some with servers, and some with Internet connections. There has been a shift from teaching about technology, to teaching with technology. ICT is being integrated in all subjects to improve the overall quality of learning. Most teachers are using ICTs for teaching, but also use them for administration. Most students use ICTs for learning, yet the overwhelming majority of schools are not connected. Good Practices in the Philippines include: the ICT in Basic Education Curriculum (BEC), the DepEd Computerization Programme, PCs for Public High Schools (PCPS), Outsourcing through the Adopt-A-School Programme, Intelligent Computer Assisted Instruction (CAI) in English, Maths & Science, the Intel Teach to the Future Programme, Orientation of School Heads on Efficient & Effective Management of Technology Environment in the School, and Awards for Excellence on Best Practices in the Use of ICT in Teaching & Learning. As part of Pilipinas SchoolNet, teachers have been developing tele-collaborative projects, many of which are multi-disciplinary.

As for infrastructure and facilities in Thailand, by August 2003, all secondary schools had computers at a ratio of 1:54. 71 per cent also have Internet access. By the end of 2005, all primary schools will be equipped with computers. Successes of note include the MOE-initiated One District, One Dreamed School Project (ODODS), running since 2003. This project involves ICT implementation in 921 schools at all levels from administration to e-learning. The IPST Project Handheld Technology for Teaching/Learning Science and Maths in 1999 involved seven pilot schools, sensors (probes), data loggers, and a computer interfaced lab for physics, chemistry, biology and a graphic calculator for maths.

The development of SchoolNets in each country differs widely, with the term meaning anything from basic connectivity, to collaborative projects, management systems, content development tools and more.

In Viet Nam, Edunet was established in 1998, with the basic concept of connecting the schools together and sharing information and resources, as well as acting as an Education Management Information System (EMIS), and as an educational base on the Internet for e-learning.

Meanwhile, Indonesia's recently launched Edukasi.net involves the implementation of e-learning in an effort to improve the quality of learning in general. Currently in its initial stages, the project provides materials for maths, physics, chemistry and biology. These materials will be used as resources to support the learning process in general secondary schools and vocational secondary schools. Edukasi.net covers vocational and secondary schools initially. It will be developed into a fully fledged SchoolNet over the next two years. To make this happen in a short time, a modification in the Web structure is necessary. Among the modifications will be a revised work plan, and a content management system for teachers to easily post material on the Web.

SchoolNet

A “SchoolNet” project in Malaysia to provide Internet broadband facilities to all 10,000 primary and secondary schools is being implemented. The first phase of the project involving 110 schools in Sabah and another 110 schools in Sarawak has been completed. By mid-2004, all schools will be connected by the SchoolNet. The nation also has a rich e-learning portal with much online content for use in the classroom.

Pilipinas SchoolNet is seeking to build a network of schools throughout the Philippines that will leverage the Internet and related technologies to improve teaching and learning. Only about 2 per cent of schools currently have connectivity. Pilipinas SchoolNet will soon develop interactive learning materials for all of the principal learning areas.

SchoolNet Thailand (1995-2002) was established with the support of the National Electronics and Computer Technology Center (NECTEC), the Telephone Organization of Thailand (TOT) and the Communications Authority of Thailand (CAT). There is also a “UniNet” which supports and connects all universities and the higher education institutions of Thailand. SchoolNet and UniNet together form the National Education Network: EdNet (2002-2005). A Digital Library was set up in 2000 under NECTEC, Kasetsart University (KU) and IPST (<http://school.net.th/library>). Under this project content was provided for teaching and learning activities in seven subjects at the secondary school level: Computer science, maths, physics, chemistry, biology, engineering, and environmental science.

Pilot Schools

The SchoolNet Project calls for three schools to be selected that already have some IT facilities, and where most students have a good understanding of English.

The pilot schools chosen for Myanmar all have Internet access. The first school has 102 teachers and 57 trained in computers already. The school has 16 computers. The second school is in an urban area and has only 10 teachers trained in computer skills, while the third school has 46 teachers trained.

In Indonesia, the three schools have also been identified – one in Sumatra, and two in Java.

Malaysia has chosen two urban schools, and one school in an underserved area. The teachers have been trained and workshops run, along with a programme of change management. 300,000,000 Ringit has already been spent on this Project.

In Cambodia, the Project can not be started in schools in rural areas because of infrastructural lacks. Even the three pilot schools chosen are not very well equipped as yet.

In Viet Nam, the pilot schools chosen are one in Bag Giang Province, one in Ho Chi Minh City and one in Quang Tri Province.

Thailand will pilot test the project in one school in Bangkok, one school in the East, in Rayong province, and one school in the Northern city of Chiang Mai.

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Discussion Issues

Many critical issues were discussed during the meeting. Often our question and answer sessions after presentations led to a general discussion on a number of pressing issues. Below you will find a summary of deliberations, including the questions and comments that stimulated them.

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Language

In the context of the design of the SchoolNet project, if one is anticipating the establishment of a network, then the issue of language in that project becomes important. If the assumption is that the medium is English, then we are dealing with a marginalised group.

In terms of content, the question here is: Do you go on to promote the use of English at the risk of damaging the diversity of language, or do you go the more expensive route and develop your own materials in the local languages?

The countries involved in this Project showed very different ways of tackling this difficulty, as their varying contexts demand. Malaysia takes the first route, taking advantage of English language content on the Internet. With principle subject areas all being increasingly taught in English, the students show a high level of fluency, making Internet use possible. In Thailand on the other hand, with the majority of teachers and students not being proficient in English, this route is impossible, so instead they are looking into ways to translate Web content, as well as developing more of an online presence in Thai. NECTEC developed a browser button provided through the website, where you type in the URL and click to translate English Web pages into Thai. The ethos here is that though the translation is not 100 per cent correct, at least users can get some information. Some schools have been using this function. A Digital Library project was also set up in collaboration with IPST to develop pilot content on science and technology in Thai. After that, teachers at each school were encouraged to continue developing content with their own materials, using the Digital Library tool. Recently, much effort has been made to put more content online in Thai, and to ease the process of putting content online through the tool. Where possible, as in Bangkok where students are more proficient in English, students are encouraged to join international projects, helping them to further improve their English.

In Viet Nam on the other hand, it is unlikely they will be able to use the translation tool. People don't say hello, they say "Where are you going", so to translate directly

would be nonsense. Indonesia also expressed difficulties in this area when trying to adapt American maths, science, and English software and other materials into Indonesian. When they used the US materials in maths, for example, they had a problem with the coding, as where one country used commas, the other used full stops.

Notably, Lao PDR plans to use the Lao language on computers using OS Linux - www.laolinux.net, as shown at the World Summit on the Information Society (WSIS) by the Jhai foundation.

In fact, it is relatively easy to put up materials in different languages. However, when we start to communicate between schools, we will need to use English, which proves more difficult. One way to get around this is to select pilot schools where students and teachers can speak English. As far as content goes, national content will be in national languages, but selected material will be translated into English and put online. The National SchoolNet must be in the country language, but the sub-regional SchoolNet will be in English. If we want to ensure careful integration, we probably can not do that right away in all the schools. We need to trial run first. Material can be shared later.

One fascinating thing about the SchoolNet Project is the variety of countries and levels of experience, and many materials being already available. There can be a rich interchange of the lessons learned, and good practices identified that are likely to be applied elsewhere. There are very different backgrounds and approaches, and so a richness of activity exists.

For example, SEAMEO has been running an interesting project called RSIP – The Regional School Internet Project (see http://www.relc.org.sg/school_int_main_page.htm). Communication between the schools was very difficult in the beginning, so they started with very simple topics, e.g. public transportation, and exchanged information. Email and communicating activities soon arose, as the use of ICT in language acted as a springboard for telecollaboration.

Regional Collaboration and Networking

Clarification is needed of the relationship between efforts to build national SchoolNets and the intention to promote regional collaboration.

The strength of the regional SchoolNet will depend on how strong the national schools become. One consideration is that among the eight countries, the level of development of SchoolNets will vary widely. One concern would be the scenario in countries like Cambodia and Lao PDR where SchoolNets are not set up or are not as developed they are in Singapore, Malaysia, the Philippines and Thailand. What are the implications of this for the nature and extent/inclusively of the SchoolNet project's regional collaboration efforts? What kinds of telecollaboration activities should be designed for the region? If we want all eight countries to be involved in a regional project which is centrally designed, then we need to consider that Cambodia or Lao PDR will be starting from zero - their learning curve will be sharp. We can not then design too complex a telecollaborative project. Initially, we should remain focused on national activities, see how strong the national SchoolNets become, and then decide what to do regionally and what languages would be

appropriate. It is unrealistic to expect that all eight countries will participate in one project in English.

Based on the experience of Pilipinas SchoolNet, even if activities are matched to the curriculum, even if we find common activities, resolving the language issues, it still doesn't guarantee that schools will collaborate successfully. Successful telecollaboration is a much more difficult process than one might think. Pilipinas SchoolNet set up everything seemingly correctly, but out of 30 projects, only eight succeeded. One of the problems is that there is no collaborative culture in schools. In some cases, competition is more the norm than collaboration. Many did not even know how to collaborate within their own schools. To counteract these initial difficulties Pilipinas SchoolNet has wisely taken a step back, focusing on strengthening the community of practice within the school, and so building an on-site support system.

Developing and Integrating Content

The Project includes the objective “To develop interactive educational software and ICT-based teaching and learning lessons and materials for integration into the teaching of science, maths and language subjects.” What kind of software/materials should be developed and how can we ensure that they are successfully integrated to enrich teaching and learning?

Questions to consider when developing software for the “Strengthening ICT in Schools and SchoolNet Project in ASEAN Setting” include: Would that kind of courseware be transferable or exportable e.g. to Viet Nam or the Philippines? Would the curricula focus on same learning competencies? Is that assumption made in project design? There may be difficulties, as there are huge differences in the maths, science and technology curricula in different countries. For example, are there the same benchmarks in Grade 4 maths in different countries? Content being shared amongst schools is not for wholesale adoption. There is a strong need for customization.

Yet this is not just an issue of adaptation and adoption of content, but also one of approach – what are the methods found in a particular piece of software that would be useful for another country to use? We need to consider not only facts, or written material but teaching and learning approaches. The best approach would be to make available to participating countries the full range of what exists in case some materials already developed are applicable. For this reason, this SchoolNet Project plans initiate the process of developing locally-based materials organized at the country level with an inventory of existing materials already developed in maths, science and language. All software must be really interactive, so as to support the development of high-level thinking skills.

The experience of the Smart School Project in Malaysia provides a good model for content development. Initially the main concern of the project was on content. Having the provisions for infrastructure is one thing, but what content can one supply to schools? The Smart School Project developed courseware to use in either a network system or stand-alone – a large number of materials were created based on the curriculum, so that the courseware supports teaching and learning. Yet while 1495 titles have been produced – a huge number of which are for the core subjects –

Malaysia still cannot properly claim that the courseware has meaningfully enriched and supported teaching and learning.

The Smart School Project found that successful integration of ICTs into teaching and learning is less about capacity, than the attitude and willingness of teachers. Like other new curricula, it takes a long time and sometimes never happens for teachers to use new materials creatively and well. Some teachers have to get over doubts that they might have about their capacity to use the technology. We need to consider what can be done better at the school level to get teachers actively using the technology.

Also worth noting here, the experience of Thailand has been that for successful ICT integration, the key issue depends on pedagogy, not on the hardware or software. Under the nationally implemented “Princess Sirindhorn Information Technology Project”, software was chosen from the US, and integrated into maths, science and language. The task was to find out whether foreign software could be meaningfully integrated into Thai schools. Realizing the focus is not on software but on pedagogy, the Project trained teachers to write lesson plans to integrate these tools into curriculum. Teachers did not just use the software provided, but could simulate their own, exceeding original expectations.

Teacher Training

Quite often teachers do not have the time to develop courseware – Is there a need to train the teachers in software development – should it not be contracted out to the private sector?

The technical experts are not educationalists, so the educators need to really know what they want from the courseware. Educators are the experts when it comes to educating through technology. There is innovation, assessment and delivery by the teachers, so teachers should be the ones to develop the materials. Realising this, Malaysia sought the help of teachers to develop content.

Training of teachers in schools – It is difficult to get teachers out of schools to undergo training – how could we improve this?

If teachers are being pulled out of the classroom for training at the weekends/holiday time, they are given service credits in the Philippines. In Malaysia, they get over the difficulty of taking teachers out of classrooms for training by conducting all training during the holidays in December.

Under the SchoolNet Project, sub-regional training is to be conducted, but such training involves pulling teachers out of the schools to travel overseas. Duplication of training can be taken care of by identifying the training needs of the countries and compiling them.

Connectivity

On creating an environment for ICT work: The definition of SchoolNet includes “connectivity to the Internet”. Does this apply to the minority of schools because the infrastructure is not in place? Does the SchoolNet Project have an intermediate alternative to connectivity?

We can distribute content in many ways so do not necessarily need two-way connectivity, though collaborative projects do depend on two-way communication. There are processes for introducing new technologies, but one would be hard pressed to describe these as intermediate models. It is most important to look at connectivity, but we should rather ask, what are the reasons schools do not have connectivity? Looking at connectivity across countries, the common trend is mobilization of telecom companies.

Best Practices

The term “best practices” keeps coming up. What is the definition of “best practices” and what tests are applied to recognize them?

Looking at best practices in the use of ICTs in learning, we consider

1. accessing information,
2. informative use,
3. creative use, and
4. communicative use.

“Best practices” would include even the latter two purposes, i.e. both creative and communicative use.

As for professional development, “best practices” are teacher training programmes with the full range of teacher competencies, such as developing higher thinking skills. In curriculum integration meanwhile, the project is considered a best practice if ICTs are integrated both into national and sub-national curricula and into textbooks.

On the other hand, when we are looking at best practices, we should not be prescriptive – effective ICT integration involves using ICT as a mediation tool in order to enhance the learning process in schools. In each country, the context of operation is different to finances, infrastructure, types of student, culture of organization, etc. Each country’s best practices will depend on the context of their own country and education system, as well as ICT use in context.

Since many are opposed to the term ‘best’ practice, perhaps the term ‘good practice’ is preferable.

Intellectual Property Rights (IPR)

People have been saying “there’s a lot of content out there”, but what about the IPR issue? We can not use content without paying for it. What is the model for financing content, or is this a public broadcasting type of model, i.e. with subsidies from the government/partner agencies? How do SchoolNets finance content over a period of time?

Much content is produced that is ready to be shared. Teachers are also beginning to contribute their lessons and materials. We need to think about what IPR models can be used to get maximum value from the Internet. The Internet provides zero publishing costs and one set up, making it easy and cheap to publish. Governments need to develop rights to publish models.

Interestingly, in Malaysia’s e-learning portal, the private company that developed it owns the homepage of the website, but software rights are owned by the Government. Indeed, of the 1,494 pieces of software developed, all rights are the

Government's. More is also being developed and the Government will also own their IPR.

Champions

As for champions in the implementation of some projects, the concern is, should we propagate the idea of champions, which may be detrimental to team spirit?

We should think more of the use of “champion” as verb: to promote and advocate, rather than relating to being a winner (there are no losers!). Here we are looking more at a person who would be the prime mover in that particular context, e.g. within the Ministry of Education, within the school, as a ‘change agent’ rather than a champion. This concept varies from country to country depending on the level of ICT development. In the beginning, champions may be required, yet as the country progresses, there is more support for the programme and champions are not so necessary.

Top-down v Bottom-up

Most of the projects seem to be top-down. Are there implementations that are bottom-up?

In the project Wireless WAN-Kota in Indonesia, each city builds its own wireless system. A number of countries apply the top-down approach, but we must constantly look at the needs of the school level. The top-down approach is often practiced at the initial stage. Bottom-up tends to take place more in non-formal education.

Sustainability

On the issue of sustainability: This is a three-year project; after this project has finished - what then?

There are two main aspects to consider here: sustainability in the three pilot schools, and the integration of lessons learnt into the larger system. One reason for this Workshop and Sub-Regional Meeting is to ensure the official support and commitment from South-East Asian countries. Unlike a lot of pilot projects begun in isolation from line ministries, we want this Project to be firmly embedded in ministries, hence the linkages with the *SEAMEO High Officials Meeting* – encouraging these high level officials to buy in to the use of ICTs and internalize it as something they are committed to. We hope that this mechanism is one which would lead to MOEs seeing the schools not as isolated pilots: ICTs will be systematically become part of mainstream education system. If after three years these are dropped by MOEs then they will not be sustainable. Early commitment will ensure they will not be abandoned, as well as real integration of MOE planning into policy. Only then will the projects succeed in the long term. Also, if we are successful in integrating ICTs into the curriculum, they will be integrated into textbooks which will see widespread use. What we are aiming at is to insist on the integration into the national curriculum, which will also ensure sustainability.

Also, there must be more emphasis on the capacity-building of teachers and schools, so it's not a UNESCO/ASEAN Foundation project, but rather, a government/MOE project with the support of UNESCO/ASEAN Foundation. We should create a sense of ownership, fully involving teachers. This will give more impact, as teachers will

transfer knowledge amongst each other. Teachers and school principals should adopt technology themselves first. After the three years, it will be the country's responsibility to sustain the SchoolNets, so the more support we build up in the early stages, the better.

Identifying partner contributions - What contribution are we expecting?

This can vary from in-kind support to financial. For example, the appointment of national ICT co-ordinators and a team that will implement the project. Coca-Cola has expressed interest, but there are others who may also want to be involved. A number of countries have adopt-a-school initiatives with the private industry, which is involved in everything from teacher education through to hardware/software. The private sector does not usually operate by itself, but usually in collaboration with the ministry of education or the national technology board.

Government Internet Control/Content Control

Criticism of censorship in Viet Nam stimulated the following response:

Even the US has control for pornographic sites. In Viet Nam, some leaders thought that the Internet must be controlled, so they set up a firewall, but it might slow the Net. In fact, the Government did not realize that it is impossible to control - they only control some sites that are against the regime, and can not control what is on the Internet. Other leaders said that the best way to control the Internet is through education, not through technology.

Partners

Part
6

Innovative Practices/ Strategies and Initiatives

Prospective donors and partners made presentations on projects they have supported that involve the innovative use of ICTs to support education.

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Coca-Cola Corporation

Coca-Cola partners with governments, non-profits, multi-lateral organizations and educators in a pan-Asian programme that aims to help empower a new generation of teachers and students through the innovative, fun and locally-appropriate use of ICTs in education.

One common thread that runs throughout country operations is that they tend to stem from the local level, and not from a macro perspective. Local leaders are always integrally involved in the project from the beginning. In fact, when looking for specific partners, the corporation chooses partners that give the expertise to ensure that both national and local needs are met. Coca-Cola tends to provide the seed money for these various programmes. They are now looking at how to promote cross-cultural exchange between countries, with depressed urban communities as their priority target area.

Examples of successful collaborations include Project Hope in China, where over 60,000 students in remote villages in rural areas have been reached. In Indonesia, the company is working to develop libraries to promote youth education and social welfare. Meanwhile, in Malaysia they are working with UNDP to work directly with teachers and students in the “e-learning for life” project. Being particularly successful, the plan is to soon extend this model elsewhere. In the Philippines, Coca-Cola has partnered with FIT-ED to reach 15,000 students since 2001. In Australia, the company partners with a local NGO to set up “Beanbag Net Centres” for youth in disadvantaged communities.

Microsoft

Microsoft has already been working around the world to promote greater access to technology tools and training for more than 20 years. In all, they have donated about \$1.4 billion in cash and software. The company works with partners in

government, education, non-profits and other companies. A good example is the \$100 million Club Tech programme with the Boys & Girls Clubs of America, which is aimed at helping the organization's 3.6 million young people master the basic and advanced technological skills they need to succeed.

With the goal of making lifelong learning a reality for people and communities around the world, the company has launched "Partners in Potential", which consists of two separate programmes that deal with non-formal and formal education.

"Partners in Learning" empowers teachers in the neediest schools by helping them get the latest computer technologies at the lowest possible cost, and offering them the training they need to make the most of those technologies. Most schools use donated PCs, and Microsoft offers them copies of Windows 98 or 2000 free of charge. They also offer free upgrades to Windows XP Professional for newer computers that are already in the classroom, and are making copies of Office XP Pro available to schools at just a few dollars a copy. At the same time, they are also going to invest more than \$250 million over the next five years in customisable teacher training that will cover everything from basic technology skills to helping them integrate computer technology into curricula. All this is conducted on a local basis, trying to match the exact needs of the schools that need it most in each specific country and region in more than 70 countries—focusing on low-income countries.

In the non-formal sector, "Unlimited Potential (UP)" offers technology-related skills training for disadvantaged young people and adults through community-based learning centres. \$1 billion in cash and software is being committed to UP over the next five years. Microsoft partners with already established community learning centres to really enhance the IT skills programmes they offer, to help them improve access to that training, and to get them hooked up to the technology they need. The company helps with everything from online resources and tools to curriculum development, from help-desk services to best practices. Meanwhile, a global and regional awards programme uses the venture-capital model to "invest" in technology solutions that deliver a social benefit. The first round of grants has already been made to nearly 80 learning centres around the world.

Intel Thailand

Intel believes that integration of technology in education is key to success in the Knowledge Economy. Their mission is to drive education improvement as the trusted partner of educators and governments worldwide. They seek to achieve this goal by: increasing the effective and innovative use of technology in teaching and learning; accelerating the advancement of university curricula and research in strategic technology areas; improving technical fluency and problem solving skills among under-served youth through effective community-based education; and increasing the numbers of young women and under-represented youth successfully pursuing careers in technology.

The company has been making contributions to education since its foundation in 1968. Large-scale involvement began in 1989. Intel has invested more than \$700 million in education worldwide to date. In the future they plan to deepen their efforts through the sustained commitment of time and resources.

The Intel approach is to collaborate with people from government, industry, and education in communities around the world. Their programmes are located in more than 50 countries on all seven continents and are customized to meet the needs of each community. Teachers are given tools, strategies, and resources that they can use in the classroom.

The programme covers elementary and secondary education, community education and higher education. Programmes have been launched in Malaysia, the Philippines, Viet Nam and Thailand. In every country the follow-up and evaluation is considered the most important aspect.

Successes include “Teach to the Future”, a worldwide professional development programme created for teachers, by teachers, to help them effectively integrate technology into the classroom to enhance student learning. Through the programme, Intel has provided professional development to more than 1,000,000 teachers in 30 countries. The company also offers an online professional development course for maths educators utilizing research from the 2003 released Third International Maths and Science Study (TIMSS) Video Studies to help improve students’ algebra performance. There is also a website, which has online resources for professional development, interactive tools for teaching and learning and online curriculum and workshops. The content is very easy to localize to the counties’ specific needs.

Under community education, the company runs Intel Computer Projects for Innovative Minds, and the Intel Computer Clubhouse Network. As for higher education, Intel is collaborating with top universities around the world to accelerate the advancement of research and curricula in the areas of computing and communication.

SEAMEO SEAMOLEC at a Glance

SEAMEO was set up in 1965 to strengthen regional understanding and cooperation in education, science and culture for a better quality life for people in South-East Asia. One of the 15 centres of SEAMEO is the SEAMEO Regional Open Learning Centre (SEAMOLEC) <http://www.seamolec.or.id>, with the vision of becoming a centre of expertise in open learning and distance education. Their mission is to assist SEAMEO member countries in identifying educational problems, and finding alternative solutions for sustainable human resources development through the dissemination and effective use of open learning and distance education.

SEAMOLEC runs an active Research and Development Programme and provides consulting services related to IT. Under their IT programme, as well as building up infrastructure, they are developing a technology-base and Web-based learning programmes. They also conduct a staff development programme.

New initiatives include the “Facilitating and Expanding the Regional School Internet Project”, and a project that involves the preparation of teacher training on the use of IT in teaching maths, science and language.

SEAMOLEC are now developing open and distance learning in Lao PDR.

References

Presentations

South-East Asian ICT Advocacy and Planning Workshop for Policy-Makers and National ICT Coordinators, 15 December 2003

- *Synthesis of experiences in South East Asia in the Integration of ICT into Education Systems: Lessons Learned*, by Lim Cher Ping
- *Start-up Toolkit for SchoolNet Operations*, by Stephen Marquard

Sub-Regional Meeting of National ICT Coordinators on Project Planning and Management, 16-18 December 2003

Country Presentations on ICT in Education and SchoolNet

Cambodia

Master Plan for 2004-2005: SchoolNet Project in Cambodia by Om Sethy, Director of Information and ASEAN Affairs Department, Ministry of Education, Youth and Sport, Cambodia

Indonesia

The use of ICT in school and the development of Indonesian Schoolnet as a part of ASEAN Schoolnet by Harina Yuhetty, Director, Center for Information and Communication Technology for Education, Ministry of National Education, Indonesia

Lao PDR

The Use of ICT in Education in LAO P.D.R by Kadam Vongdeuane, Ministry of Education, Lao PDR

Malaysia

ICT in the Malaysian Learning Environment by Y. Bhg. Datin Dr. Nor Hayati Abd Rasid, Director, Educational Technology Division, Ministry of Education, Malaysia

Myanmar

Strengthening ICT in Schools and SchoolNet Project in ASEAN Setting: Country Report Myanmar by U Tin Nyo, Director General, The Department of Basic Education, Ministry of Education, Myanmar

Philippines

Information and Communication Technology in Basic Education by Orlando Oxales, Director for Technical Service, Department of Education, Philippines

Thailand

The Use of ICT in Teaching/Learning Science and Mathematics in Thailand by Pramuan Siripunkaew, Institute for the Promotion of Teaching Science and Technology (IPST), Ministry of Education, Thailand

Viet Nam

ICT in Education and EduNet by Quach Tuan Ngoc, Center of Information Technology, Ministry of Education and Training, Vietnam

Coca-Cola Presentation on Activities in Asia

Coca-Cola ICT education initiatives in Asia by Tim Wilkinson, Public Affairs and Communications, the Coca-Cola Export Corporation

Intel Thailand

Intel® Innovation in Education Initiative by Tatsanee Setboonsarng, Education Program Manager, Intel Microelectronics (Thailand) Co., Ltd., Thailand

Microsoft

Partners in Potential: Making lifelong learning a reality for people and communities around the world, by Sam Jacoba, Academic Business Manager, Enterprise & Partner Group, Microsoft Philippines Inc.

SEAMEO SEAMOLEC at a Glance

SEAMOLEC Participation in the Strengthening ICT in Schools and SchoolNet Project in ASEAN Setting, by Soekartawi, Director, SEAMEO Regional Open Learning Center (SEAMEO SEAMOLEC), Indonesia

Appendix 1

Agendas

TENTATIVE AGENDA

Monday, 15 December 2003

- 09.00-09.45 **Opening Remarks**
- » Mr. Arief S Sadiman, Director, Southeast Asian Ministers of Education Organization Secretariat
 - » (SEAMEO Secretariat)
 - » Mr. Sheldon Shaeffer, Director of the UNESCO Asia and Pacific Regional Bureau for Education
 - » Mr. Ruben C. Umaly, Executive Director, ASEAN Foundation
 - » Mr. Takashi Asai, Assistant Director General, Ministry of Education, Culture, Sports, Science and Technology, Japan
- 09.45-10.00 *Coffee break*
- 10.00-12.00 **Session I: Project Overview**
- Chair: Ruben C Umaly
- » Introduction to JFIT Programme on ICT in Education in Asia and the Pacific by Sheldon Shaeffer, Director, UNESCO Asia and Pacific Regional Bureau for Education and UNESCO Bangkok
 - » Presentation of the Project on Strengthening ICT in Schools and SchoolNet in the ASEAN Setting: *Carmelita L. Villanueva*, Chief, Information Programme and Services and Project Coordinator, UNESCO Bangkok
 - » Synthesis of Experiences in South East Asia in the Integration of ICT into Education Systems: Lessons Learned: *Lim Cher Ping*, Singapore
 - » Start-up ToolKit for SchoolNet Operations: *Stephen Marquard*, ICT Consultant, South Africa
- 12.00-13.00 *Lunch*

- 13.00-14.45 **Session II: Establishing Cooperation and Commitment from South East Asian Countries**
- Chair: Sheldon Shaeffer
- Key issues:
- » Ensuring official support and commitment from South East Asian countries
 - » Endorsing the integration of ICT into the curriculum of science, mathematics and language and identifying mechanisms/strategy for ensuring this integration
 - » Identifying the National Team who will implement the Strengthening ICTs in Schools and Schoolnet Project in the ASEAN Setting
 - » Identifying three pilot schools to be included in the project
 - » Refining and endorsing the over-all project work plan
 - » Identifying and committing counterpart contributions
- 14.45-15.00 *Coffee-break*
- 15.00-16.30 **Session III: Discussion and Signing of Memorandum of Agreement**
- Chair: Arief S Sadiman
- 16.30-17.00 **Conclusion of the meeting**

Tuesday 16 December

- 08.30 – 09.00 **Opening**
- » Short welcome remarks by C.L. Villanueva, Chief, Information Programme and Services, UNESCO Bangkok and Project Coordinator
 - » Objectives, Expected Outcomes and Approval of Workshop Agenda by Ms. Carmelita L. Villanueva,
 - » Logistics Arrangements by Ms. Tinsiri Sribodhi, Project Assistant
- 09:00 – 10:15 **Session I: Country Presentations by Cambodia, Lao, Myanmar and Viet Nam**
- Presentations will focus only on:
- » The use of ICT in the curriculum of science, math and language as well as curriculum revision processes in the country
 - » Inventory and description of existing ICT-based materials already developed in science, math and language and description of the development process used and users
 - » Teacher training already provided to teachers and materials used for teacher training (how many and what levels of training)

	<ul style="list-style-type: none"> » ICT infrastructure in the schools, e-readiness and connectivity – number and kinds of computers available, Internet connection and speed, who is paying, where computers are located and hours of access; existence of ICTs outside of schools; existence of an ICT maintenance unit; etc. » Existing SchoolNet and how they can be used for this project » Pilot Schools- location and facilities of the pilot Schools, teachers’ skills and training, connectivity, etc.(Cambodia, Lao, Myanmar, Vietnam)
10.15-10.30	<i>Coffee break</i>
10.30 – 12.00	Continuation of Session I: Indonesia, Malaysia, Philippines and Thailand
12.00-1.30	<i>Lunch</i>
1.30 – 03.00	Session II: Presentations from Partners, Donor Agencies, and Other Stakeholders Focusing on How They Can Assist the Project
03.00 – 03.30	<i>Coffee-break</i>
03.30 – 05.00	Session III: Evaluation of SchoolNet Toolkit
07:00	Reception Dinner Host by UNESCO Bangkok

Wednesday 17 December

09.00 – 10.30	Session IV: Project Planning and Management Group work by Countries to Develop Master Plans <ul style="list-style-type: none"> » Rationale » Objectives » Organizational framework, Country Team and responsibilities of all parties involved in the Team » Working policies and mechanisms » Strategies and activities » Work plan and timetable » Budget required
10.30 -10.45	<i>Coffee break</i>
10.45 – 12.30	Group Report on Project Planning and Management Discussion and Comments

12.30 – 01.30	<i>Lunch</i>
01.30 – 03.00	<p>Session V: Identifying Entry Points in Science, Math and Language Curriculum</p> <p>Group Work by Countries to Develop Scope and Sequence or Curricular Framework</p> <ul style="list-style-type: none"> » Develop scope and sequence or curricular framework showing how ICT-based lessons can be integrated into existing textbooks of science, math and language » Listing existing lessons and other ICT-based materials; educational software and multimedia materials already developed and used in science, math and language (titles, target users, for which subject, methodologies used, short description of contents, etc.)
03.00 – 03.30	<i>Coffee-break</i>
03.30 – 05.00	<p>Group Report on ICT-Based Scope and Sequence or Curriculum Framework</p> <p>Discussion and Comments</p> <p>Chair:</p>

Thursday 18 December

09.00 – 10.30	<p>Session VI: Pilots Schools</p> <p>Group work: Term of Reference, Requirements, Locations, and Evaluation of activities</p>
10.30 – 10:45	<i>Coffee break</i>
10.45 – 12.00	Session VII: Group Report on the Pilot Schools
12.00 – 01.30	<i>Lunch</i>
01.30 – 03.30	<p>Session VIII: Future Activities</p> <ul style="list-style-type: none"> » Training courses » Compilation of packages of existing lessons in science, math and language » Follow-up National ICT Planning Meetings » Logistics and contracts » Evaluation of country projects
03.30 – 03.45	<i>Coffee-break</i>
03.30 – 05.00	Session IV: Discussion, Wrap Up, Conclusions and Closing

Appendix 2

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Appendix 3

Project Work Plan for All Countries - 2004-2005

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Group one countries: Indonesia, Malaysia, Philippines, and Thailand (IMPT)

Group two countries: Cambodia, Myanmar, Lao PDR, Viet Nam (CMLV)

- » 4-day National Follow-up Programme Planning Workshops by National Coordinators – January 2004
- » 10-day Sub-Regional Training Course on basic ICT for group 2 (CMLV) countries; including identifying entry points for the three subjects – February 2004
- » Compilation of resources package of existing ICT-based lessons and teaching and learning materials on selected subjects and development of a regional guidebook for integration of ICT-based materials into the three subjects – January-March 2004
- » Workshop to identify existing Web-based resources, CD-Roms, video resources, and developing lessonplans as well as a national guidebook on the interactive use of these materials in the three subjects; then compilation and adaptation of existing materials as well as development of additional lesson plans and pre-testing etc. in group 1 countries – February-June 2004
- » Workshop to identify existing materials as well as develop lesson plans and national guidebook for group 2 countries at the sub-regional level assisted by international consultants - February-June 2004
- » Sub-regional training for group 1 countries to use the ICT-based materials compiled and on the upgrading of skills to develop lesson plans for IMPT countries and how to integrate ICT into science, maths and language – July 2004
- » Sub-regional training for group 2 countries to use the ICT-based materials compiled and on the upgrading of skills to develop lesson plans for IMPT countries and how to integrate ICT into science, maths and language – July 2004

- » Equip CLMV countries with equipment, connectivity and facilities and pilot test the materials developed in all pilot schools – January-March 2004
- » 2-day regional planning and training workshop on the creation of national and regional SchoolNet – August 2004
- » Regional training course of website managers, teachers and SchoolNet technical personnel in CLMV countries on the development and maintenance of SchoolNet – August-September 2004
- » Develop South-East Asian SchoolNet site with existing national SchoolNets in group 1 countries – November-December 2004
- » Posting/uploading new national SchoolNet in CMLV countries – September-October 2004
- » Pilot testing of ICT in schools and SchoolNet
- » Implementing tele-collaboration activities – January-June 2005
- » 3-day seminar to exchange experiences, lessons learned and best practices – September 2005