



SCHOOL NETWORKING

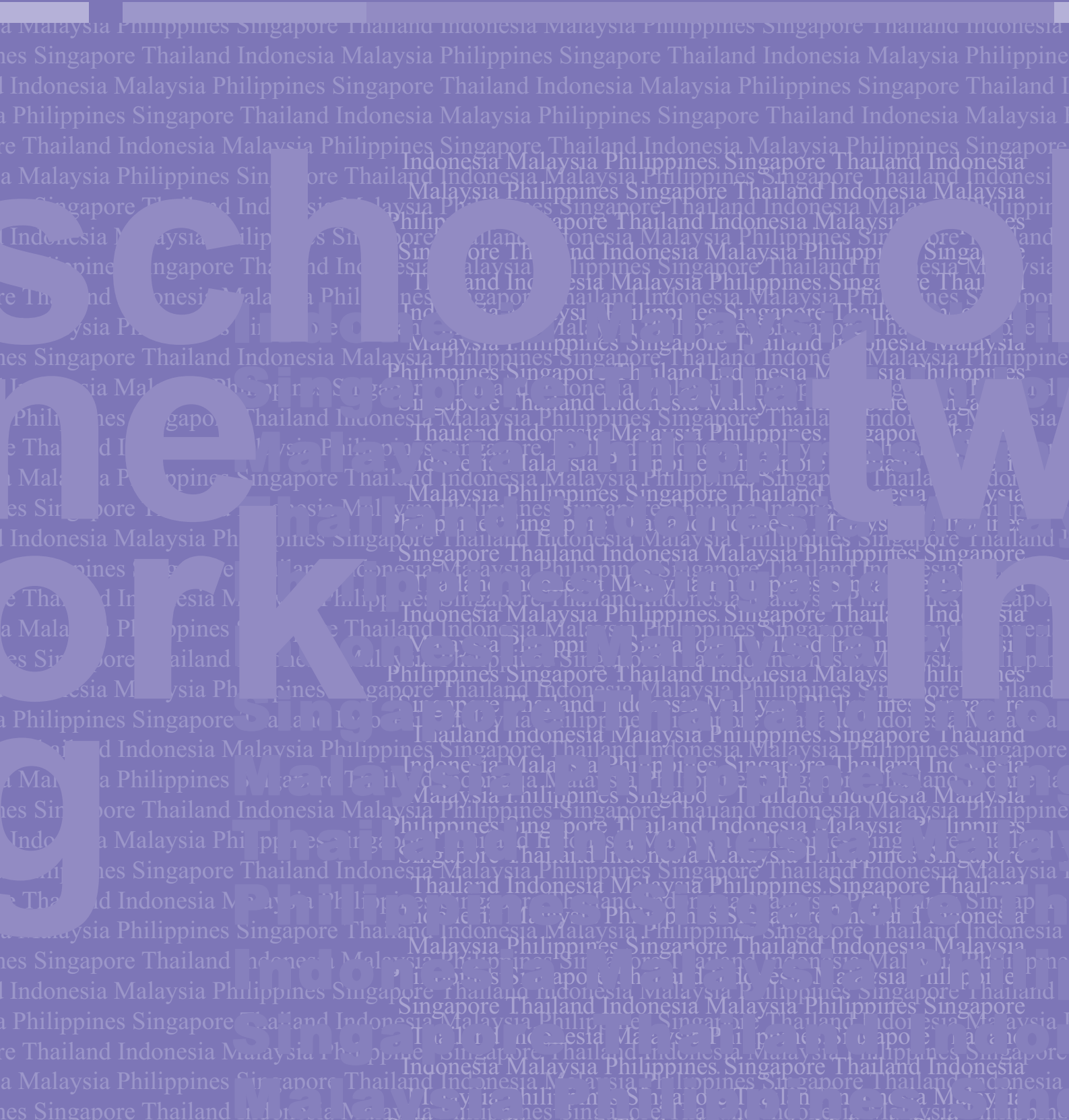
lessons *learned*

A Collective Case Study of Five Asian Countries
Indonesia • Malaysia • Philippines • Singapore • Thailand



SCHOOL NETWORKING:

LESSONS LEARNED



SchoolNetworking: lessonslearned

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PREFACE

This collection of lessons learned about SchoolNet operations provides a distillation of the rapidly growing body of experiences and innovative strategies from countries in the Asia and Pacific region. SchoolNets are so transformative because they combine many different aspects of incorporating ICTs into learning. At best, they include nationwide or international networks of schools, teachers, parents and resources; forums; databases; teacher training; interaction among students and teachers; collaborative projects between schools and nations; and more. Students become engaged in exploration and simulation instead of being passive recipients of information. Teachers can use ICTs for administrative and assessment purposes, as well as to enliven their teaching and share resources, inspiration and challenges with other teachers. On a wider scale, SchoolNets have even accelerated the technology-based modernization of education systems and schools.

Many countries in Asia and the Pacific have now begun some kind of SchoolNet, with varying degrees of success. However, distilling these experiences to cull out lessons learned, innovative strategies and practices has not yet been conducted. This becomes vital when one thinks of the potential waste of funds and investment, as well as the little time that policy makers and managers have to plough through all the available information. Realising the opportunity for knowledge-sharing in this area, UNESCO Bangkok commissioned the writing of five country case studies which this Lessons Learned publication synthesizes. Written by ICT specialists who are directly involved in the implementation of the ICT for education programmes in their respective countries, the case studies:

- 1 Document, synthesize and extract lessons learned in the use of ICT in schools and in the setting up/ impact of SchoolNets in selected countries in order to help improve planning, management and implementation of ICT for education programmes;**
- 2 Provide tools for advocacy, as well as guidelines for policy makers and practitioners, to support ICT in education initiatives; and**
- 3 Serve as benchmarks for implementing project activities of the JFIT-funded Strengthening ICT in Schools and SchoolNet Project in ASEAN Setting, specifically the integration of ICT into national curricula of ASEAN countries, the development of a Start-up toolkit and operation of SchoolNets.**

These five case studies are from the following countries and experts:

1 Indonesia

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2 Malaysia

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3 Philippines

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4 Singapore

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5 Thailand

Dr. Thaweesak Koanantakool, Director, NECTEC and Dr. Chadamas Thuvasethakul, Assistant Director, NECTEC

This is the first activity under the project *Strengthening ICT in Schools and SchoolNet Project in ASEAN Setting* that involves the active participation of Indonesia, Malaysia, Philippines, Thailand, Cambodia, Myanmar, Lao PDR, and Viet Nam. The UNESCO Asia and Pacific Regional Bureau for Education leads the project implementation with core funding from the Japanese Funds-in-Trust and the ASEAN Foundation, and in partnership with the South-East Asian Ministers of Education Organization (SEAMEO) and SEAMEO's Regional Open Learning Centre (SEAMEOLEC). The project is an attempt to demonstrate that the use of ICT in education will make a difference in improving the teaching/learning process through the systematic integration of the use of ICT into existing educational curricula on science, mathematics and language. Under the project, each country is developing or improving their own national SchoolNets, while working towards a regional SchoolNet that will pool resources and link the nations in collaborative learning projects. (For more on the SchoolNet Project, please see our Web page <http://www.unescobkk.org/education/ict/schoolnet>).

SUMMARY OF LESSONS LEARNED

Based on the experiences of five countries, namely Indonesia, Malaysia, Philippines, Singapore and Thailand, the following lessons were learned.

RATIONALE/OBJECTIVES

Why SchoolNet?

- 1 A SchoolNet with a strong foundation that is grounded on a solid rationale and a unified set of objectives is better able to put its networking operations on target.
- 2 To sustain a SchoolNet's rationale and objectives over the long term, it is important to cultivate and nurture an enabling environment for stakeholder participation, to broaden network objectives in response to new/emerging needs, and to introduce a wide range of improvements and upgrades as networking operations expand.

POLICY AND DEVELOPMENT SUPPORT

Role in National Policy and Programme on ICT Use in Education

- 1 SchoolNets that have the advantage of being a part of the government system or bureaucracy possess the potential to make significant/direct contributions to the MOE policy and/or the national policy on ICT use in education.
- 2 A SchoolNet's role in the national ICT policy is further enhanced if there are adequate inputs from the stakeholders, and if their level of involvement is high.

Leadership and Distributed Leadership

- 3 Good leadership ensures that the SchoolNet is set up in support of a government's ICT policy, and that its operations are always pursued along this line.

Awareness and Advocacy

- 4 A common goal of awareness and advocacy activities is to generate greater participation by school policy makers, administrators, teachers and students in SchoolNet programmes and activities.
- 5 Awareness and advocacy activities come in different forms, and these are selected and deployed based on the needs and priorities of individual SchoolNets.

MANAGEMENT, ORGANIZATIONAL STRUCTURE, PARTNERSHIP AND FINANCIAL STABILITY

Coordinator/Focal Point and Range of Organizational Structures

- 1 The depth and breadth of coordination are influenced by the nature of a SchoolNet's founder/organizer and by its level of authority.
- 2 An ideal SchoolNet situation is one where the duties and responsibilities of the coordinator, focal point, or steering committee are defined, and/or important organizational structures and working relationships are established.

Personnel Requirements

- 3 Network personnel, at different levels of authority and responsibility, should possess the professional qualifications that allow a SchoolNet to fulfil its objectives.

Budgetary Resources and Requirements

- 4 Budget considerations should take into account funding sources and the various expenses incurred by SchoolNet operations, including hardware and software; personnel salaries; training and/or retraining/skills upgrading programmes; expansion; and equipment maintenance, repair and upgrading.
- 5 Identifying and tapping funding sources to help ensure an adequate SchoolNet budget are the cornerstone of any SchoolNet project because the participation of stakeholders, users and the community, at large, is crucial.

Partnership in the SchoolNet

- 6 A SchoolNet project is only as good as the partners working on it. Partners should be selected wisely, making sure that their goals and objectives are compatible with those of the project, and that there are no conflicts of interest.
- 7 To optimize its operations, a SchoolNet can join partnerships that focus on the development of ICT resources, ICT infrastructure and support, and the professional development of educators and so on.

Provision of SchoolNet Operating Guidelines

- 8 Critical areas in a SchoolNet's operation benefit from the application of operating guidelines. Such areas include the selection of schools, SchoolNet activities and strategies, security procedures, and ways and means to create greater public interest.
- 9 Stakeholder inputs, needs assessment findings, and site inspections should be taken into account when developing operating guidelines, thus ensuring that guidelines respond to actual needs and real-life situations in a SchoolNet.

Institutionalization and Sustainability

- 10 The process of institutionalizing SchoolNet operations can be approached in different ways, depending on the level of development of the SchoolNet and the objectives of its organizer/founder.
- 11 To help institutionalize and sustain SchoolNet operations, it is best to tap the active participation and involvement of schools, administrators, teachers, experts, students, parents, and other stakeholders.

Synergies with Other National and Regional SchoolNet Programmes

- 12 Existing networks should be encouraged to join hands, and to integrate so that schools can enjoy the optimum benefits that each network provides.

INFRASTRUCTURE AND CONNECTIVITY

Start-Up Phase and Minimum Core Requirements

- 1 The start-up phase is a particularly critical period that could build a solid foundation for SchoolNet operations, or, on the other hand, lead to early signs of unsuccessful networking.
- 2 There are different models and approaches to initiate and support the start-up phase, and they pose both strengths and weaknesses.

Infrastructure and Computer Configuration in Schools

- 3 Clearly, good physical and technological infrastructure is necessary for the smooth operation of a SchoolNet. Old PCs tend to malfunction, and more technical problems are encountered in schools that have existing PCs compared to those with brand new computers.

Location of Servers

- 4 The location of the servers (i.e. centrally operated and/or located, decentralized, or a blending of the two) poses strengths and weaknesses. Regardless of its location, the server should be upgraded as a SchoolNet expands.

Connectivity Options

- 5 Ease of connectivity encourages schools to join SchoolNets. There are a number of enabling measures that can be adopted, such as free hosting facilities and domain; free Internet connection for the first year; monthly payments at special “educational rates” for the leased line and telephone; and sharing the cost of Internet access between the schools and the MOE.

Support from Other Connectivity Sources

- 6 SchoolNets looking for affordable connectivity costs should approach local telecommunications companies to reduce their rates for Internet access and, where applicable, to sell computer equipment, software, and applications at discounted prices.

CURRICULUM INTEGRATION, CONTENT DEVELOPMENT AND KNOWLEDGE MANAGEMENT

Curriculum Integration

- 1 Curriculum integration is a complex facet of SchoolNet operations that requires experimentation and creativity on the part of teachers who, in the first place, should have received adequate theoretical and practical training in curriculum and courseware development.

Pedagogy and ICT Integration

- 2 As the pedagogy shifts from being teacher-centred to being student-centred, there is a greater need for teachers to structure the learning experience, and to provide guidance and supervision.

Content of SchoolNet Website

- 3 The content of SchoolNets can be rooted in the mandate of national ICT policy of individual countries and/or the national curriculum.
- 4 To ensure relevance and educational value of the contents, particularly material in the national language, content development should be assigned to professional curriculum developers, or alternatively, to subject specialists, qualified teachers, school administrators and students working as members of a team.

SERVICES

Help Desk

- 1 An efficient Help Desk is one that (i) has the right number of qualified staff to carry out a wide range of technical duties and responsibilities, (ii) offers staff training and (iii) provides a network management framework to ensure the smooth flow of responses to enquiries, offers of assistance, and data storage.

Troubleshooting and Maintenance

- 2 Since many SchoolNet members are not capable of troubleshooting and providing maintenance services, these can be outsourced. However, it is desirable to offer training and to build capacity for adequate and autonomous maintenance work.

TEACHER AND PERSONNEL TRAINING

Skills Needed

- 1 Regardless of where training emanates from, it should satisfy the needs of networking operations. Often, in the case of SchoolNets that are an integral part of government policy on ICT in education, training emanates from the MOE or other relevant government agencies. On the other hand, SchoolNets that do not fall within the MOE programme may take the initiative to conduct their own training activities.

Teacher Incentives and Motivation after Training

- 2 An incentive scheme to keep teachers interested and motivated is highly desirable. Such a scheme could go a long way in raising teacher morale, which could be dampened by unfamiliarity with ICT and slow uptake of ICT skills, restrictions placed on local on-line learning materials that are accessed through the Internet, and the high cost of Internet connections.

RESEARCH, MONITORING AND EVALUATION

Research and Monitoring/Evaluation Strategy

- 1 Contributions made to date by SchoolNet ventures, as well as current gaps and inadequacies in their operations, should be researched, monitored and evaluated to provide a basis for future improvements and expansion.

Performance Indicators

- 2 To determine the success of SchoolNet operations, a set of key performance indicators should be developed and applied accordingly.

How to Collect Evidence of Success

- 3 Research, monitoring and evaluation are the pillars of a SchoolNet operation, and a good starting point is to collect evidence of success.

ACRONYMS AND ABBREVIATIONS

ACM	Assistant Centre Manager (Philippines)
BDC	Backup Domain Controller (Malaysia)
CM	Centre Manager (Philippines)
CAT	The Communications Authority of Thailand
CITE	The Center for Industrial Technology and Enterprise (Philippines)
DepEd	Department of Education (Philippines)
DTVE	The Department of Technical and Vocational Education (Indonesia)
FIT-ED	The Foundation for Information Technology Education and Development (Philippines)
GSS	General Secondary Schools (Indonesia)
ICT	Information Communications Technology; the term used to describe the tools and the processes to access, retrieve, store, organize, manipulate, produce, present and exchange information by electronic and other automated means
ISDN	Integrated Services Digital Network, an international communications standard for sending voice, video, and data over either digital telephone lines or normal telephone wires
JSS	Junior Secondary Schools (Indonesia)
KRDL	Kent Ridge Digital Labs (Singapore)
LAN	Local Area Network
LINUX-SIS	LINUX School Internet Server (Thailand)
MECM	The Ministry of Energy, Communications and Multimedia (Malaysia)
MOE	The Ministry of Education
MP1	The first Master Plan for ICT in Education (Singapore)
MS	Microsoft
NCB	National Computer Board (Singapore)
NECTEC	The National Electronic and Computer Technology Center (Thailand)
NGO	Non-Governmental Organization
PC	Personal Computer; often used to mean an IBM or IBM-compatible personal computer, as opposed to other types of personal computers, such as Apple Macintoshes
PDC	Primary Domain Controller (Malaysia)
PLDT	Philippines Long Distance Telephone Company
PS	Primary School (Indonesia)
PTCA	Parent-Teacher-Community Association
SIN	School Information Network (Indonesia)
SSMS	Smart School Management System (Malaysia)
SSO	Single Sign-On, a capability in a network which allows users to seamlessly access all authorized resources on the basis of a single authentication when the user logs on
TOT	Telephone Organization of Thailand
UPOU	The University of the Philippines Open University
VCO	Virtual Community Organizer
VSS	Vocational Secondary Schools (Indonesia)
WAN	Wide Area Network

OVERVIEW AND LESSONS LEARNED

Discussions within this component seek to answer the question: *Why SchoolNet?*, referring to the whys and wherefores behind the establishment of SchoolNets. The rationale and objectives vary from country to country, and from one SchoolNet to another. The decision to establish a SchoolNet could take into account wide-ranging considerations, some of which are: (i) the goals of the national ICT policy and/or master plan, (ii) the central government's commitment to implement the national ICT policy and/or master plan, (iii) the priority given to ICT use in education to enhance teaching and learning, (iv) the priorities and focus of interest of sectors and organizations that are prime movers in using ICT as a tool for national progress and development, and (v) the level of development of ICT facilities in individual countries, and their efforts to narrow the digital divide between urban and rural areas.

Based on the experiences of the five countries with respect to the rationale and objectives of setting up a SchoolNet, the following lessons were learned:

Why SchoolNet?

- 1 A SchoolNet with a strong foundation that is grounded on a solid rationale and a unified set of objectives is better able to put its networking operations on target.
- 2 To sustain a SchoolNet's rationale and objectives over the long term, it is important to cultivate and nurture an enabling environment for stakeholder participation, to broaden network objectives in response to new/emerging needs, and to introduce a wide range of improvements and upgrades as networking operations expand.

SYNTHESIS OF EXPERIENCES

ISSUE: WHY SCHOOLNET?

lesson learned 1

A SchoolNet with a strong foundation that is grounded on a solid rationale and a unified set of objectives is better able to put its networking operations on target.

Indonesia

WAN Kota arose from the need for vocational secondary schools (VSS) to develop a communications forum in each region. In pursuit of this objective, WAN Kota has undertaken various ways and means to enable teachers, administrators and students to use the Internet, exchange e-mails and share information. A recent district initiative to promote WAN Kota is the introduction of an on-line student admission system, giving many parents in Malang City an online facility to choose the best school for their children. The on-line student admission system is expected to become more popular given its efficiency, accuracy, reliability, accountability and transparency.

Malaysia

The Smart School Pilot Project, conducted between 1999 and 2002, helped to translate into action the Ministry of Education (MOE) policy and ICT in Education Master Plan. It was carried out to pilot test ICT use in classroom teaching, for the purpose of determining how

integrated telecommunications and computing infrastructures could help to improve teaching, learning, and school management processes. The project was successfully piloted in 87 schools located in all 15 states of Malaysia, including Sabah, Sarawak and Labuan, across the South China Sea from Peninsular Malaysia.

Philippines

Ed.venture, the Foundation for Information Technology Education and Development (FIT-ED), in collaboration with government and private sectors, is piloting Pilipinas SchoolNet, which aims to build a network of schools that use ICT in teaching and learning. To this end, Pilipinas SchoolNet has endeavoured to create opportunities for teachers, students and administrators to acquire relevant ICT knowledge, and to improve the quality of teaching and learning.

Although not an integral part of the ICT programme of the Department of Education (DepEd), Pilipinas SchoolNet

is nevertheless supportive of DepEd's ICT policy. It is worth noting that DepEd recognizes the pilot as an extension of its ICT strategy. Thus, DepEd and FIT-ED are working hand in hand to fulfil SchoolNet objectives. The latter provides funding resources, while the former gives specific forms of support, including classroom facilities, salaries for pilot teachers, and support for running costs like electricity. Furthermore, the pilot schools in the project are public schools run by DepEd.

Singapore

Another SchoolNet that has been established to help translate into action government policy and/or the ICT in Education Master Plan is Singapore's edu.MALL. Developed under the first Master Plan for ICT in Education (MP1) and launched in July 1998, edu.MALL promotes creative thinking and lifelong learning in an engaging manner by enabling teachers to access information and to exchange ideas while also reaching out to students and parents. To achieve its objectives, edu.MALL has made use of the "mall" metaphor that is familiar to the intended users as it helps users to convey knowledge and skills with greater ease to gain orientation, and it shortens the time required for user training.

Thailand

It was the power of technology to create equal opportunities to obtain an education that prompted the National Electronic and Computer Technology Centre (NECTEC) of the National Science and Technology Development Agency to take the lead in establishing Thailand SchoolNet, with cooperation from the Telephone Organization of Thailand (TOT) and the Communications Authority of Thailand (CAT).

Being a technology-focused organization, NECTEC focused the SchoolNet's initial objective on connectivity, but subsequent action was taken to address other equally important objectives, such as improving the SchoolNet's Thai language content and providing relevant teacher training. Thai authorities recognized that the effectiveness of network objectives depends on a balance of three factors: technology (including telecommunications infrastructure), teaching materials (referring to types and contents of materials), and teachers (referring to teacher qualifications).

lesson learned 2

To sustain a SchoolNet's rationale and objectives over the long term, it is important to cultivate and nurture an enabling environment for stakeholder participation, to broaden network objectives in response to new/emerging needs, and to introduce a wide range of improvements and upgrades as networking operations expand.

Indonesia

The introduction of an on-line student admission system, giving many parents in Malang City an on-line facility to choose the best school for their children, marks an improvement in the services offered by WAN Kota. This recent district initiative to promote WAN Kota is expected to gain in popularity, given its efficiency, accuracy, reliability, accountability and transparency.

Malaysia

The Smart School Network operations have yielded positive impacts on the quality of on-line teaching and learning, pointing to the potential for further contributions as networking expands. The Smart School Network is now poised to undergo upgrading to meet the goals of the roll-out plan for the Smart School project. To put the expansion moves on the right path, the problem of "last mile connectivity," referring to the connection from broadband lines to the schools, is being addressed. Some of these lines are still using copper wires. This problem constrains the network's overall usefulness.

Philippines

There are encouraging signs that the organization of e-learning clubs in each pilot school within Pilipinas SchoolNet is

generating increased stakeholder interest and participation in networking operations. This augurs well for the fulfillment of Pilipinas SchoolNet's objectives to create opportunities for teachers, students and administrators to acquire relevant ICT knowledge and to improve the quality of on-line teaching and learning. Students have injected new energy into the programme and have eagerly applied themselves to their respective projects, assisting their teachers when necessary, and acting as peer tutors. It is hoped that this trend will continue over the long term.

Singapore

As demonstrated by edu.MALL experience, ensuring the long-term sustainability of its rationale and objectives has also been a matter of imbuing its operations with a holistic approach towards ICT use in education. Such an approach covers ICT resources, professional development, infrastructure and support, dialogues on practices, showcases of innovative projects, and research and development. Furthermore, edu.MALL has endeavoured to serve as a support mechanism for educators to access and share information and resources, and to exchange ideas and experiences concerning ICT use in education.

Thailand

As the Thailand SchoolNet project progressed, NECTEC broadened its objectives to cover content development and human resource development, an expansion from its earlier focus on providing connectivity. Furthermore, the project has been ennobled and enriched by its pursuit of the “Complete Knowledge Cycle” where every school will be encouraged to create new knowledge from existing knowledge. The goal as its ultimate aim emphasizes the development

of quality content prototypes in the form of “learning objects” that students and teachers can use as a resource to create good quality teaching and learning materials. Teachers and students will be able to access data, use information wisely, innovate, create new information and generate knowledge, thus completing the knowledge cycle. In 2003, Thailand SchoolNet was transferred to the Ministry of Education, thereby improving its chances of accomplishing its primary, as well as its ultimate, objectives.

POLICY AND DEVELOPMENT SUPPORT

component 2



OVERVIEW AND LESSONS LEARNED

Discussions within this component focus on three issues: the role of SchoolNet in the national policy and/or programme on ICT use in education; leadership and distributed leadership; and awareness and advocacy. As regards the first issue, attention is called to the benefit of having SchoolNet as part of the MOE policy and/or the national policy on ICT use in education. Where this is not the case, it is highly desirable for efforts to be taken that link the SchoolNet to MOE policy and/or the ICT in education master plan. The second issue, leadership and distributed leadership, brings to the fore the importance of having a champion(s) and/or key organizations at the helm; while the third issue, advocacy and awareness, takes up the strategies and plans to promote SchoolNet, and to generate support for and participation in it.

Based on the experiences of the five countries with respect to policy and development support for a SchoolNet programme, the following lessons were learned:

Role in National Policy and Programme on ICT Use in Education

- 1 SchoolNets that have the advantage of being a part of the government system or bureaucracy possess the potential to make significant/direct contributions to the MOE policy and/or the national policy on ICT use in education.
- 2 A SchoolNet's role in the national ICT policy is further enhanced if there are adequate inputs from the stakeholders, and if their level of involvement is high.

Leadership and Distributed Leadership

- 3 Good leadership ensures that the SchoolNet is set up in support of government ICT policy, and that its operations are always pursued along this line.

Awareness and Advocacy

- 4 A common goal of awareness and advocacy activities is to generate greater participation by school policy makers, administrators, teachers and students in SchoolNet programmes and activities.
- 5 Awareness and advocacy activities come in different forms, and these are selected and deployed based on the needs and priorities of individual SchoolNets.

SYNTHESIS OF EXPERIENCES

ISSUE: ROLE IN NATIONAL POLICY AND PROGRAMME ON ICT USE IN EDUCATION

By and large, the operations of SchoolNets that are an integral part of the government system/bureaucracy have directly impacted on the implementation of MOE ICT policy and/or the national policy on ICT use in education. Synchronization of objectives and activities between those of a SchoolNet and those of the MOE poses distinct advantages, such as resource sharing and the reduction, if not elimination, of the risk of duplicating network products and services. Having said this, it should be pointed out that SchoolNets organized outside the government system or bureaucracy can nevertheless make significant contributions to the national policy and programme on ICT use in education.

lesson learned 1

SchoolNets that have the advantage of being a part of the government system or bureaucracy possess the potential to make significant/direct contributions to the MOE policy and/or the national policy on ICT use in education.

Indonesia

With the city government of Malang spearheading its establishment, WAN Kota has proved its potential to create an Internet community comprising students, teachers, parents and other stakeholders, through a variety of support measures and initiatives. It has developed a communications forum in each region, enabling teachers,

administrators and students to use the Internet, and exchange e-mails and information. WAN Kota's contribution, however modest, is helping to concretize national policy on ICT use. In its present stage, it is less than clear and has been unable to fully involve stakeholders in networking operations. In effect, institutions and organizations that make use of ICT in education programmes, as

well as in SchoolNets, do so in different ways. Within WAN Kota are examples of systematic networking operations.

Malaysia

The Smart School Pilot Project constitutes an integral part of MOE policy and the national ICT policy. Thus, comprehensive knowledge and analysis of the Government's ICT policy provided the basis for the project's design and formulation of objectives. The Smart School's specific objective to pilot test ICT use to improve classroom teaching and learning, as well as school management processes, is clearly supportive of the national education policy and national curricular objectives. The Smart School Network operations have yielded positive impacts on the quality of on-line teaching and learning, paving the way for further expansion of network operations.

Philippines

Although not an integral part of the ICT programme of the Department of Education (DepEd), Pilipinas SchoolNet is nevertheless recognized as an extension of DepEd's ICT strategy. Prior to its design, an analysis was carried out of the existing education policy, as well as of other policies that are relevant to ICT use in education. Pilipinas SchoolNet has aligned its goals and objectives with those of the national education policy and the national curricular objectives. Using schools run by DepEd as pilot schools, Pilipinas SchoolNet creates opportunities for teachers, students and administrators to acquire the knowledge and skills that will enable them to use ICT effectively to improve the quality of teaching and learning.

Singapore

An integral part of the ICT Master Plan, edu.MALL provides strong support to the ICT for Education Programme, serving teachers, students and parents alike. As there is synchronization between edu.MALL's objectives and activities and those of the ICT Master Plan, efficient use is made of resources. As there is division of labour and resources, duplication of services and products is reduced, if not eliminated.

Thailand

SchoolNet Thailand provides full support to human resource development (HRD) carried out under the 8th National Economic and Social Development Plan, as well as those under the National IT 2000 Plan. HRD - with a particular focus on promoting IT literacy - is one of three pillars of the National IT 2000 Plan. As a result of its transfer to the MOE in 2003, Thailand SchoolNet has improved its prospects to play a significant role in the country's system of education, as well as its potential to obtain greater government support for its operations. Initially, NECTEC, which initiated Thailand SchoolNet, set as its principal goal the bridging of the digital divide by promoting computer and Internet technologies. This has since expanded to include human resources development and content development.

The Government's central role has always been duly recognized. Three years after its establishment in 1995, Thailand SchoolNet brought in the Ministry of Education, the Ministry of Science, Technology and Environment, and the Ministry of Transport and Communications to strengthen network operations. SchoolNet's transfer to the Ministry of Education in September 2003 was in line with the country's educational reform.

lesson learned 2

A SchoolNet's role in the national ICT policy is further enhanced if there are adequate inputs from the stakeholders, and if their level of involvement is high.

Malaysia

The Smart School Network was designed in cooperation with other divisions at the MOE, thus ensuring its harmony with the Ministry's current policies and its sustainability after the pilot project.

Philippines

Extensive consultations with education policy makers and other experts, at all levels, within and outside the Government, were undertaken to map out and plan SchoolNet operations. In connection with this, first hand observations were made of how ICT facilities in the schools are currently being used, and if their utilization is in accordance with existing policy.

Singapore

To generate stakeholder involvement and to sustain user interest, edu.MALL has

made use of the metaphor of a "mall", which evokes an image that is familiar to the targeted public, and through the metaphor, conveys knowledge and skills with greater ease. The metaphor of the mall provides a useful and powerful mechanism for structuring, organizing and designing end-user interface, and navigating interactive Web-based learning environments. The metaphor has enabled teachers, students and parents to get on-board quickly.

Edu.MALL's holistic approach towards ICT use in education has attracted stakeholder involvement and user interest. Such an approach covers ICT resources, professional development, infrastructure and support, dialogues on practices, showcases of innovative projects, and research and development.

ISSUE: LEADERSHIP AND DISTRIBUTED LEADERSHIP

The range of sectors/organizations that have spearheaded the establishment of SchoolNets includes the government sector, the information technology sector, local government and NGOs, and other groups outside of government machinery. Their motivations vary, from the need to demonstrate the role of ICT in overall development, to put into action the MOE policy and master plan, to give teachers and students broader access to information resources, and so on.

lesson learned 3

Good leadership ensures that the SchoolNet is set up in support of government ICT policy, and that its operations are always pursued along this line.

Indonesia

Compared with other SchoolNets that have been established as a result of government initiatives at the highest level, WAN Kota is of a humbler origin, having been initiated by local government only. Nevertheless, the city government of Malang has done its best to prove its position as a champion in promoting ICT use in education. This is in keeping with the governmental decentralization of the administrative system down to the district level. The role of the central government (represented in this case by the Department of Technical and Vocational Education - DTVE) has been limited to formulating policy, facilitating and providing technical assistance, and monitoring and evaluation.

Steering committees have been set up with varying degrees of success to oversee the WAN Kota. On the committee are an official of the local government (District MOE) serving as adviser, and heads of associations of school principals

of Vocational Secondary Schools (VSS), General Secondary Schools (GSS) and Junior Secondary Schools (JSS) serving as chairman, secretary, and treasurer, respectively. Day-to-day running of the project has been assigned by the steering committees to one full time manager, three technicians, and three programmers, most of whom are VSS teachers and students and active SIN members.

Malaysia

Malaysia offers a good example of distributed leadership as the operation of the Smart School Pilot Project involved various MOE departments that have been mobilized by the Smart School Project Team. The team took the lead in running the network. Ten MOE officials were dedicated to the task and were supported by the consortium that developed the Smart School Integrated Solution. There was a great deal of cooperation and sharing of information and expertise among the team members. The team also worked with other divisions within the

MOE, namely the Information and Technology Division, Curriculum Development Centre, Teacher Education Division, and the Aminuddin Baki Institute, the Ministry's staff training centre.

Philippines

Leadership roles in Pilipinas SchoolNet are played by the country's corporate world, government and civil society. This being the case, the network enjoys the backing of prime movers of ICT use in education in the Philippines, and best demonstrates the benefits of concerted efforts by different sectors in narrowing the digital divide and enhancing ICT use to improve teaching and learning. Pilipinas SchoolNet traces its origin to early 2000 when FIT-ED, a Manila-based NGO, was in the process of developing Pilipinas SchoolNet. Around the same time, Coca-Cola Export Corporation was preparing its response to a global call for greater corporate participation in narrowing the digital divide. Recognizing the convergence between their goals and those of FIT-ED, Coca-Cola agreed to finance the piloting of Pilipinas SchoolNet. Ed.venture was formally launched in April 2001.

Singapore

Taking its cue from the Government's five-year ICT Master Plan, edu.MALL has been fully supportive of efforts to increase ICT use to develop a culture of thinking, lifelong learning and social responsibility. The leadership behind edu.MALL is the Government itself, collaborating closely with the business sector, community organizations and other relevant groups and associations.

Thailand

SchoolNet Thailand, initiated in 1995, is the focus of close multi-agency collaboration among NECTEC, TOT, CAT and MOE. Each agency has an important role in the project. NECTEC is responsible for technical matters (that is, design, maintenance and operation of the network and central computer systems), while the TOT is the sponsoring agency for domestic Internet bandwidth. CAT supports international Internet bandwidth, while the MOE has responsibility for selecting participant schools and for coordinating, promoting and supporting Internet use in these schools.

ISSUE: AWARENESS AND ADVOCACY

Awareness and advocacy activities and campaigns can take the form of targeted marketing strategies and plans that aim to (i) engage stakeholders in SchoolNet programmes and activities, (ii) help the SchoolNet realize its potential to connect educators, communities and IT sources and service providers, (iii) optimize and popularize the use of a SchoolNet's website resources, and (iv) recognize and encourage innovative uses of ICT for teaching and learning.

lesson learned 4

A common goal of awareness and advocacy activities is to generate greater participation by school policy makers, administrators, teachers and students in SchoolNet programmes and activities.

Indonesia

WAN Kota's recently introduced on-line student admission system is a form of an awareness and advocacy activity. It is generating user interest and participation at all levels, particularly among parents who are in search of the best school for their children. The on-line system is expected to boost the popularity of WAN Kota, with the spread of public knowledge about this new way to obtain school placement.

Malaysia

Throughout the pilot phase of the Smart School Pilot Project, network use was promoted by organizing a series of competitions for students and teachers for the best websites, and by encouraging them to work with other schools in developing their websites. The pilot project further promoted awareness and encouraged collaboration by successfully creating a Smart School Network community. Communications among the Smart School Development Team members, and between the team and the

schools, are mostly through e-mail exchanges.

Singapore

The potential for edu.MALL to connect educators, communities and IT sources and service providers was further enhanced when it was launched in tandem with Singapore ONE@Schools, another initiative under MP1. Singapore ONE@Schools is aimed at providing schools with broadband access, enabling them to have high-speed access to a wide range of media-rich information and resources to support ICT use in education.

Thailand

SchoolNet Thailand's awareness and advocacy activities have yielded positive results and have contributed to the promotion of ICT use in education. The positive impact is seen in the increased use of ICT, the rapidly growing number of computers found in the schools, the professional development of teachers, and the development of Thai content on the Web by concerned authorities.

lesson/learned 5

Awareness and advocacy activities come in different forms, and these are selected and deployed based on the needs and priorities of individual SchoolNets.

Indonesia

A priority need for WAN Kota is to develop among its targeted users a healthy attitude and behaviour towards ICT. In response to this need, it has made use of awareness and advocacy activities, such as on-line student admission, which advocates an efficient, accurate, reliable, accountable and transparent system of student placement. It prevents collusion with local administrators and bribery with school officials. Another form of awareness and advocacy activity is the annual national skills competition on ICT technology that is organized especially for VSS students. The best ten are awarded university scholarships, enabling them to develop their potential to become prime movers for ICT development in their respective workplaces or cities.

Malaysia

The Smart School Pilot Project experience points to the importance of awareness activities that stress the acceptability of official communications in the form of electronic mails, in addition to the traditional form of memos printed on letterheads. Furthermore, awareness activities are also useful in the case of new processes/facilities associated with SchoolNet operations. These should be endorsed in government or ministry circulars.

The Smart School Pilot Project also recommends intensive change management activities to convince school authorities to allow/encourage teachers, staff and students to use ICT facilities,

such as the e-mail, Internet, bulletin boards and so on.

Philippines

Awareness and advocacy activities that involve the community are expected to be placed prominently in the activity plans of e-learning clubs set up in each school. A planning workshop and a series of instructional design workshops were held to ensure that e-learning club projects would be effective and curriculum-relevant. Awareness and advocacy activities should be able to motivate the teachers, students and other stakeholders to inject new energy into the programme. New tools, ensuring ease of use by teachers and students, have been developed to document the experience of the e-learning clubs.

Singapore

Since taking on edu.MALL, CHAPTER-E.com has partnered other education and industry players for networking improvements and support. A new activity is an e-procurement drive that equips students with an on-line debit facility to shop on-line in edu.MALL for education-related products (reference and supplementary materials, non-fiction and fiction books, novelties and electronic gadgets).

Thailand

To further boost the SchoolNet, NECTEC encouraged school participation in international collaborative projects, such as the Global Learning and Observations

to Benefit the Environment (GLOBE) Programme and the ThinkQuest Project.

Going by its experience, Thailand SchoolNet recommends that any investment in computer equipment or network infrastructure should be preceded

by efforts to create awareness and understanding among the target groups, including school administrators, teachers and students. The goal is to encourage the target groups to recognize the importance of ICT use in education.

MANAGEMENT, ORGANIZATIONAL STRUCTURE, PARTNERSHIP AND FINANCIAL STABILITY

component 3



OVERVIEW AND LESSONS LEARNED

Discussions within this component focus on the need for effective management of a SchoolNet. Considerations include organizational structure, partners and resources that allow SchoolNets to cope with current demands, as well as to meet future expansion needs. The following issues are discussed: coordinator/focal point and range of organizational structures; personnel requirements; budgetary resources and requirements; partnership in the SchoolNet; SchoolNet operating guidelines; institutionalization and sustainability; and synergies with other national SchoolNet programmes. Taken together, these issues weave an intricate pattern of networking operations. On its own, each individual issue is an important thread, without which the pattern is less complete.

Based on country experiences with SchoolNet-related management, organizational structure, partnership and financial stability, the following lessons were learned:

Coordinator/Focal Point and Range of Organizational Structures

- 1 The depth and breadth of coordination are influenced by the nature of a SchoolNet's founder/organizer, and by its level of authority.
- 2 An ideal SchoolNet situation is one where the duties and responsibilities of the coordinator, focal point, or steering committee are defined, and/or important organizational structures and working relationships are established.

Personnel Requirements

- 3 Network personnel, at different levels of authority and responsibility, should possess the professional qualifications that are required by a SchoolNet so that it can fulfil its objectives.

Budgetary Resources and Requirements

- 4 Budget considerations should take into account funding sources and the various expenses incurred by SchoolNet operations, including hardware and software; personnel salaries; training and upgrading programmes; expansion; and equipment maintenance, repair and upgrading.
- 5 Identifying and tapping funding sources to help ensure an adequate SchoolNet budget are the cornerstones of any SchoolNet project because the participation of stakeholders, users and the community, at large, is crucial.

Partnership in the SchoolNet

- 6 A SchoolNet project is only as good as the partners working on it. Partners should be selected wisely, making sure that their goals and objectives are compatible with those of the project, and that there are no conflicts of interest.
- 7 To optimize its operations, a SchoolNet can join partnerships that focus on the development of ICT resources, ICT infrastructure and support, and the professional development of educators.

Provision of SchoolNet Operating Guidelines

- 8 Critical areas in a SchoolNet's operation benefit from the application of operating guidelines. Such areas include the selection of schools, SchoolNet activities and strategies, security procedures, and ways and means to create greater public interest.
- 9 Stakeholder inputs and the findings of needs assessments and site inspections should be taken into account when developing operating guidelines, thus ensuring that guidelines respond to actual needs and real life situations in a SchoolNet.

Institutionalization and Sustainability

- 10 The process of institutionalizing SchoolNet operations can be approached in different ways depending on such considerations as the level of development of the SchoolNet and the objectives of its organizer/founder.
- 11 To help institutionalize and sustain SchoolNet operations, it is best to tap the active participation and involvement of schools, administrators, teachers, experts, students, parents, and other stakeholders.

Synergies with Other National and Regional SchoolNet Programmes

- 12 Existing networks should be encouraged to join hands and to integrate so that the schools can enjoy the optimum benefits that each network provides.

SYNTHESIS OF EXPERIENCES

ISSUE: COORDINATOR/FOCAL POINT AND RANGE OF ORGANIZATIONAL STRUCTURES

Critical to successful SchoolNet operations are the suitability of the selected coordinator or focal point, the appropriateness of its location (i.e. within the government system, from the private sector, NGO or community group) and its acceptability to the stakeholders and other concerned parties. Coordination takes a variety of forms and assumes a variety of priorities. There are exciting dimensions to the tasks as well. These include opportunities to (i) explore new possibilities for acquiring and constructing knowledge in creative ways through interactive activities in a learning community, and (ii) obtain feedback from the stakeholders for the purpose of improving network operations.

lesson learned 1

The depth and breadth of coordination are influenced by the nature of a SchoolNet's founder/organizer, and by its level of authority.

Indonesia

As WAN Kota is a local government-initiated project, it was deemed appropriate to assign the responsibility for overseeing its operations to steering committees that have been set up across cities.

The responsibility for overseeing the WAN Kota Project is in the hands of steering committees that have been set up across cities. The committee membership includes a local government representative as adviser, and heads of school principal associations for

Vocational Secondary Schools (VSS), General Secondary Schools (GSS) and Junior Secondary Schools (JSS) as chairman, secretary, and treasurer, respectively.

Responsibility for running the project on a day-to-day basis lies with a full time manager (1), technicians (3), and programmers (3), all of whom are appointed by the steering committee. The appointees are mostly VSS teachers or students, and active members of the School Information Network (SIN).

Malaysia

As the driving force behind the Smart School Pilot Project is the MOE, coordination emanates from a high level. Different MOE departments, each with specific expertise and areas of responsibility, have been tapped to work with the Smart School Pilot Project team. The MOE departments included the Information and Technology Division, Curriculum Development Centre, Teacher Education Division, and the Ministry's Aminuddin Baki Institute staff training centre. Ten MOE officials were dedicated to the task, and were supported by a consortium that was chosen to develop the Smart School Integrated Solution.

Philippines

The focal point for Ed.venture is FIT-ED, a non-governmental organization that was founded in 1998 to help promote ICT use in education and training, business and government. Pilipinas SchoolNet is FIT-

ED's flagship programme in the area of ICT in education. FIT-ED coordinates the project in collaboration with public and private sector partners, as well as NGOs and academic institutions.

Thailand

In SchoolNet's early years, NECTEC ran the operations almost single-handedly. In September 2003, SchoolNet was placed under the MOE, heralding the beginning of more dynamic and sustainable network operations, and energizing stakeholder participation and their sense of ownership of the project.

Singapore

Although edu.MALL started out as a collaborative project among the MOE, KRDL and NCB - with participation from industry - in 1999, project management was passed to CHAPTER-E.com, a venture company of the National Computer Systems (NCS) and Panpac Media.com.

lesson learned 2

An ideal SchoolNet situation is one where the duties and responsibilities of the coordinator, focal point, or steering committee are defined, and/or important organizational structures and working relationships are established.

Malaysia

The Smart School Pilot Project Team coordinated the Smart School Network during the pilot phase. The team was composed of systems analysts and educators trained in computer science. They worked with different MOE departments, each with specific expertise and areas of responsibility. The MOE departments included the Information and Technology Division, Curriculum Development Centre, Teacher Education Division, and the Aminuddin Baki Institute. A consortium was selected to develop the Smart School Integrated Solution.

Philippines

An interesting case is that of Pilipinas SchoolNet. While FIT-ED, the founding organization, is not a part of DepEd, it has nevertheless cultivated a close working relationship with schools run by the Department and its branches at the sub-national and local levels.

Thailand

Much has changed since SchoolNet's early years, when its operations were run by NECTEC. Three years after its establishment in 1995, Thailand SchoolNet brought in the Ministry of Education (MOE), the Ministry of Science, Technology and Environment, and the Ministry of Transport and Communications to

strengthen network operations. In September 2003, SchoolNet was placed under the MOE, in line with the country's educational reform. This transfer stimulated the stakeholders' active participation and increased their sense of ownership in the project. It also paved the way for sustainable network operation. Collaborations with CAT and TOT have also been cultivated and nurtured.

Singapore

The passing of the baton to CHAPTER-E.com has further strengthened edu.MALL. Backed by the ICT infrastructure and capability of NCS and the content and pedagogical expertise of Panpac Media.com, CHAPTER-E.com continues to explore new possibilities for acquiring and constructing knowledge in creative ways through interactive activities in a learning community. It has partnered other education and industry players to further improve and support edu.MALL.

Eventually, a virtual community organizer (VCO) should assume coordination of the SchoolNet. The VCO may take the role of SchoolNet operator, and bring in other business partners to expand SchoolNet to other domestic markets. This has the potential to make the existing SchoolNet's virtual community more compelling, and more economically viable in the long run.

ISSUE: PERSONNEL REQUIREMENTS

The personnel requirements and staffing patterns for SchoolNets vary depending on the goals of individual SchoolNets, their scope of work and range of activities, budgetary resources and other factors. Ideally, there should be a clear reporting system for every staff member in order to ensure the smooth flow of work and efficient network operations.

lesson learned 3

Network personnel, at different levels of authority and responsibility, should possess the professional qualifications that allow a SchoolNet to fulfil its objectives.

Malaysia

A SchoolNet should be operated by educators with the assistance of technical personnel to look after such matters as connectivity and proper functioning of equipment. In the case of the Smart School Pilot Project, the 37-member project team was composed of systems analysts and educators with computer science training. Counterparts from other divisions within the MOE, namely the Information and Technology Division, Curriculum Development Centre, Teacher Education Division, and the Aminuddin Baki Institute, collaborate with the team.

Philippines

The members of the technical support staff of the Ed.venture Centre are mostly teachers. A Centre Manager (CM) and an Assistant Centre Manager (ACM) are designated for each pilot school within Ed.venture. They are given the responsibility for the day-to-day running of the Ed.venture Centre, as well as for providing technical support to users. CMs and ACMs are

chosen based on the following criteria: computer literacy; outstanding knowledge of computers and the Internet, compared with the rest of the school staff; and willingness to undergo extensive technical support training. Possession of a background in computer science or a related field is an advantage.

As for the school administrator, he or she should (i) have a clear ICT vision for his/her school and community, (ii) be an effective leader, first and foremost by leading by example, and (iii) give priority to his/her own professional development as an ICT policy maker and manager, beginning with the goal to become ICT literate.

Going by the experience of Pilipinas SchoolNet, it is recommended that the ICT-related skill levels among teachers and staff should be a consideration in professional development planning.

ISSUE: BUDGETARY RESOURCES AND REQUIREMENTS

SchoolNets derive their funding from various sources, typically including government allocations, school fees, private contributions, partnership agreements and so on. Budget considerations for setting up a SchoolNet and sustaining its operations should be comprehensive. In addition, provisions should be made for the financial needs of the coordinating body/focal point and the schools that belong to the SchoolNet.

lessonlearned 4

Budget considerations should take into account funding sources and the various expenses incurred by SchoolNet operations, including hardware and software; personnel salaries; training and skills upgrading programmes; expansion; and equipment maintenance, repair and upgrading.

Indonesia

Participation in the WAN Kota pilot project is voluntary. Funding is derived mostly from participating schools and district governments. Contributions from the central government represent less than 20 per cent of the total initial investment, and include provision for teacher training, coordination, monitoring and evaluation. Funds are also raised from clients or participating schools, averaging between 10 and 40 schools per city. Depending on the business plan of the respective clients, regular maintenance and operating costs could be built into the clients' annual contribution of around US\$ 300 per client. Taking into account the number of the network's ultimate beneficiaries (i.e. students), the cost is around 30 US cents per student per month. School committees and District Education Boards have not raised any objection to this financial

obligation. Additional sources of funds are advertisements and other sponsorships. An entrepreneurial management team has proposed a cost-recovery or income generating business plan.

Malaysia

The MOE shouldered the cost of setting up the Smart School Network, and provided the software necessary for development of school websites. The schools were allowed to purchase their own software to upgrade their respective websites. Maintenance, expansion and upgrading costs will also be borne by the MOE. The team has already requested government funding. The budget was a serious consideration in determining network design, particularly in regards to server capacity at the schools and at the Data Centre, and bandwidth allocations.

Philippines

In the case of Pilipinas SchoolNet, Coca-Cola Export Corporation (Asia-Pacific Group and Philippine Division) presented a US\$550,000 grant to FIT-ED for Ed.venture and committed an additional US\$450,000 for pilot expansion. DepEd, through the pilot schools, provides counterpart funds to retro-fit a room to house the Ed.venture Centre in each school, and to pay for recurring costs (e.g. electricity, supplies and salaries of in-school technical support staff). As DepEd has no budgetary allocation for ICT in education programmes apart from the annual national budget to purchase school computers, it is largely private sector support that sustains the project. Additional support is solicited from local governments; school boards and parent-teacher-community associations (PTCAs); alumni associations; NGOs; local academic and training institutions; and other community stakeholders. In most of the schools, the PTCA has allowed the annual collection of between US\$2 and US\$10, from each student who uses a school's Ed.venture Centre.

Singapore

The edu.MALL harnesses the expertise and experience of industrial partners, and is a good example of a network that is run as a business enterprise, providing one-stop access to educational resources and on-line information services for teaching and learning.

Thailand

There are promising prospects for greater government funding with the transfer of Thailand SchoolNet to the MOE in September 2003.

In February 1998, the merging of the SchoolNet with the Kanchanapisek Network resulted in the establishment of a large-scale nationwide IP network called SchoolNet@1509, to signify the special telephone number (1509) that can be used anywhere in Thailand to access the network. Users are charged the local telephone call rate regardless of where they call in Thailand.

lesson learned 5

Identifying and tapping funding sources to help ensure an adequate SchoolNet budget are the cornerstones of any SchoolNet project because the participation of stakeholders, users and the community, at large, is crucial.

Philippines

In addition to funds committed by the Coca-Cola Export Corporation and the support provided by DepEd, additional sources of support (including local governments, school boards and parent-teacher-community associations (PTCAs), alumni associations, NGOs, local academic and training institutions and other community stakeholders) are being tapped. In most of the schools, the PTCA has allowed the annual collection

of between US\$2 and US\$10 from each student who uses the school's Ed.venture Centre.

Thailand

The issue of a special "educational rate" for the schools, to cover the cost of the leased line and telephone lines, is being negotiated between TOT and the MOE. For schools that have the budget, the cost for Internet access can be shared between the schools themselves and the MOE.

ISSUE: PARTNERSHIP IN THE SCHOOLNET

SchoolNets thrive on the support extended by various sectors, ranging from government agencies to IT industries and business concerns, from private and voluntary groups to training institutions, universities, and NGOs. The type and duration of support vary from one-time offers of assistance to project-based funding, from pilot tests to donations of equipment, software, platforms and connectivity. Ideally, a SchoolNet should be able to identify what value each partner adds to its operations, and this should be assessed based on programme requirements and constraints. There are pros and cons behind certain partnership arrangements, and these should be carefully considered.

lesson learned 6

A SchoolNet project is only as good as the partners working on it. Partners should be selected wisely, making sure that their goals and objectives are compatible with those of the project, and that there are no conflicts of interest.

Malaysia

A key partner signed up by the Smart School Pilot Project team was a consortium to develop the Smart School Integrated Solution. The consortium was primarily involved in installing, testing and maintaining the network together with the project team, developing the course and computerized software and security requirements, and providing troubleshooting services.

Philippines

Ed.venture has embarked on partnerships in support of Pilipinas SchoolNet. The primary technology partner, CITE Technical Institute, a private vocational-technical school based in Cebu City, worked on determining the core technical requirements for the pilot. It provides technical training and technical support to

the pilot schools, on-line and at the site. The connectivity partners, Globe-Isla and PLDT, the country's two largest telecommunications companies, have offered one-year free telephone and Internet service to pilot schools located in their respective service areas, and a 50 per cent discount thereafter. This collaboration between government, private sector, and NGOs is proof of the close partnerships that have been cultivated to promote the country's public school system.

Singapore

The business sector has been a major source of support for the operations of edu.MALL, which is run as a business enterprise that provides one-stop access to educational resources and on-line information services for teaching and

learning. Singapore has capitalized on the expertise, infrastructure and services of the business sector to deliver all aspects of creating and operating the edu.MALL.

Thailand

During various phases in the implementation of Thailand SchoolNet, NECTEC collaborated with TOT, CAT, MOE and Kasetsart University, among

other institutions. The SchoolNet has benefited from support extended by the private sector, especially from three vendors, namely Compaq, Intel and Powell Computer. These companies donated Pentium computers to 32 schools in rural areas. Microsoft also donated 50 sets of Windows 95 and utilities to speed up school activities on the Net.

lessonlearned 7

To optimize its operations, a SchoolNet can join partnerships that focus on the development of ICT resources, ICT infrastructure and support, and the professional development of educators.

Malaysia

While the experience of the Smart School Project points to the benefits of having the MOE as a patron and prime supporter, the project also cites the desirability of having a SchoolNet's physical infrastructure actively supported by a service provider, in its capacity not just as a vendor but as a "smart" partner. This is important especially in terms of getting an "educational price" for telecommunications support and maintenance.

Philippines

By entering into partnership agreements with the IT sector and universities,

Ed.venture has covered the technical, connectivity and professional development needs of Pilipinas SchoolNet. Technical training and technical support to the pilot schools, on line and at the site, is being provided by primary technology partner, CITE Technical Institute. In addition, CITE evaluated the core technical requirements for the pilot. The connectivity partners, Globe-Isla and PLDT, have offered one-year free telephone and Internet service to pilot schools located in their respective service areas, and a 50 per cent discount thereafter.

ISSUE: PROVISION OF SCHOOLNET OPERATING GUIDELINES

Operating guidelines developed by relevant authorities contribute to the smooth and effective administration of the SchoolNet and the coordinated pursuit of networking activities. Operating guidelines should be monitored and evaluated for their effectiveness. They should be amended, as needed.

lessonlearned 8

Critical areas in a SchoolNet's operation benefit from the application of operating guidelines. Such areas included the selection of schools, SchoolNet activities and strategies, security procedures, and ways and means to create greater public interest.

Malaysia

Clear guidelines concerning management and security procedures have contributed to the smooth operation of the Smart School Network. These guidelines are contained in the Smart School Management System (SSMS) user manuals and in the Smart School IT Security Policies and Procedures document. All users must log on before using their workstations and other network resources. A Single Sign-On (SSO) capability in the network allows users to seamlessly access all authorized network resources on the basis of a single authentication when the user logs on. All users have to be uniquely identified with a unique user ID before access to the SSMS is allowed. They are personally accountable for any activity attributed to their respective user ID. The level of authorized access is consistent with the user's job requirements and access is

limited to resources that are required to carry out an approved task or function.

Philippines

Ed.venture's operating guidelines offer a very precise set of criteria, which provided the basis for the selection of the 15 pilot schools. Preference was given to schools recommended by DepEd or by programme partners, as well as to schools that could provide a room for the Ed.venture Centre and retro-fit it to satisfy prescribed technical specifications. Preference was also given to schools that could initiate and support ICT-enhanced teaching and learning practices, and fund pre-operational costs and other recurring costs. A school's access to reliable electricity supply, landline telephone connections and one or two Internet service providers, preferably Globe-Isla and PLDT, were considered as definite advantages.

lessonlearned 9

Stakeholder inputs and the findings of needs assessments and site inspections should be taken into account when developing operating guidelines, thus ensuring that the guidelines respond to actual needs and real life situations in a SchoolNet.

Philippines

Going by the experience of Pilipinas SchoolNet, the formulation of guidelines on the selection of schools can benefit from the following: a thorough inspection of the school environment; a needs assessment conducted among teachers and staff; an evaluation of their level of ICT-related skills; a comprehensive technical assessment of facilities; provision of full-time custodial and technical support staff for ICT facilities; an evaluation of the general quality of

teaching and learning in the school; the school's financial sustainability plan and assessment of its viability (with preference given to schools that have good prospects or financially supporting the ICT programme over the long term); and a comprehensive understanding of the internal politics within the school and the community, of the leadership structure, of the distribution of power, and of conflicts among different groups that might undermine the programme.

ISSUE: INSTITUTIONALIZATION AND SUSTAINABILITY

Launching a SchoolNet is only half the task. A greater challenge is ensuring sustained interest in the role of the network and continued support for its operation. Different measures are used to solicit stakeholder participation and interest. Some measures include connecting a greater number of computers to the Internet, making the computers available beyond official school hours, and rewarding innovative ICT use.

lesson learned 10

The process of institutionalizing SchoolNet operations can be approached in different ways depending on the level of development of the SchoolNet, and the objectives of its organizer/founder.

Malaysia

Efforts to institutionalize and sustain the Smart School Network are being carried out following the completion of the pilot project and approval of the national roll-out plan. The Smart School Team is working to integrate the Smart School Network in the KPMnet, with BESTARInet providing the pedagogical content for the schools. The team will also integrate the Ministry of Energy, Communications and Multimedia's pilot Universal Service Provision Project, which aims to provide telephone and Internet access to 220 remote schools in Sarawak and Sabah (110 in Sabah and 110 in Sarawak). The pilot project will be expanded as the Malaysian SchoolNet Project, aimed at providing Internet access to all 10,000 schools in the country.

The expanded functions of the Smart School Network during the national roll-out will be coordinated by an expanded

Smart School Development Team, with a sub-team dedicated to the maintenance, management and development of the network. At the school level, the IT Coordinator will remain as the single point of contact for problem log-ins and resolution.

Thailand

The SchoolNet's transfer to the MOE in September 2003 augurs well for its long-term sustainability. Negotiations have been held to reduce, if not eliminate, the cost of Internet access among schools that do not have sufficient funding. The TOT and the MOE are negotiating to charge them monthly fees based on an "educational price" that will cover the leased line and telephone lines. For schools that have the budget, the cost of Internet access can be shared between the schools themselves and the MOE.

lessonlearned 11

To help institutionalize and sustain SchoolNet operations, it is best to tap the active participation and involvement of schools, administrators, teachers, experts, students, parents and other stakeholders.

Malaysia

Communications among the stakeholders were facilitated through the Smart School Network that was developed during the pilot project. Further to this and as a result of additional change management activities, more and more schools are expected to use the network on a regular basis, leading to strong and solid participation by the stakeholders that could help to institutionalize and sustain networking operations over the long term.

Philippines

The establishment of e-learning clubs in each pilot school in Pilipinas SchoolNet is a step towards institutionalizing network operations. Workshops to plan activities for school year 2003-2004 were followed by instructional design workshops to develop the clubs' framework, instructional materials, and assessment tools to evaluate effectiveness and curriculum-relevance of learning activities. Although e-learning club activities are not yet in full swing, and an assessment of the clubs' impact cannot be made at this time, early signs are encouraging. Some clubs have started to look at new ways to generate income to pay for recurring costs, as well as upgrades and replacements. Potential activities include (i) holding contests among teachers and students for the best school website, educational software, and teaching materials, (ii) sponsoring collaborative projects and awarding the best ones with cash or in-kind prizes, and (iii) providing the teachers with free hours for training and for practising their newly acquired skills.

Singapore

The edu.MALL experience demonstrates that a major step towards institutionalizing SchoolNet operations is by making the SchoolNet accessible via the Intranet and Internet to optimize its potential as a one-stop Web-based access to educational resources and on-line information services for teaching and learning. This will ensure access to the SchoolNet anywhere and at anytime, and will pave the way for the development of a virtual community organizer (VCO) that could eventually take on the management of the SchoolNet. The VCO could assume the role of SchoolNet operator and bring in other business partners to expand the SchoolNet to other parts in the country.

Thailand

Thailand SchoolNet has raised a clarion call for "equal opportunity/equal access to information", a task that is best achieved with cooperation from concerned groups and organizations. In the case of SchoolNet Thailand, efforts to achieve this task are demonstrated by the respective roles of NECTEC, TOT, CAT and MOE, in network operations, TOT sponsors domestic Internet bandwidth, CAT supports international Internet bandwidth, and MOE selects schools, coordinates, promotes and supports Internet use in these schools. Such multi-agency cooperation energizes the institutionalization of the SchoolNet.

ISSUE: SYNERGIES WITH OTHER NATIONAL AND REGIONAL SCHOOLNET PROGRAMMES

By joining hands with other SchoolNet programmes at the national, regional and international levels, a SchoolNet benefits from the wider involvement and participation of its peers.

lesson learned 12

Existing networks should be encouraged to join hands and to integrate so that the schools can enjoy the optimum benefits that each network provides.

Thailand

The merging of the SchoolNet with the Kanchanapisek Network (or the Golden Jubilee Network) in February 1998 resulted in the formation of a large-scale nationwide IP network for schools, called SchoolNet@1509 to signify the special telephone number (1509) that can be used anywhere in Thailand to access the Internet.

On another level, distance education projects complement SchoolNets in expanding the opportunity to obtain quality education. One example is the "Distance Education Project," which utilizes satellite communications technology to improve the delivery of education services.

Malaysia

An exemplary demonstration of synergy is found in Malaysia between the Smart School Pilot Project and the Universal Service Provision Project, which is piloted by the Ministry of Energy, Communications and Multimedia (MECM). This project seeks to provide telephone and Internet access to 220 remote schools in Sarawak and Sabah (110 in Sabah and 110 in Sarawak). Both ministries are discussing how best to integrate and expand the two projects to become the Malaysian SchoolNet Project, aimed at providing Internet access to all 10,000 schools in the country. The MECM will provide the required infrastructure technology, while the MOE will provide the pedagogical content and will help to train school heads, teachers, other staff and students to use the SchoolNet.

INFRASTRUCTURE AND CONNECTIVITY

component 4

Component 4

OVERVIEW AND LESSONS LEARNED

Discussions within this component focus on the following issues: start up phase and minimum core requirements; infrastructure and computer configuration in the schools; location of server; connectivity options; and support from other connectivity sources. The ability of a SchoolNet to achieve a satisfactory/high standard of technical performance hinges on these issues.

Based on the experiences of the five countries with respect to SchoolNet-related infrastructure and connectivity, the following lessons were learned:

Start-up Phase and Minimum Core Requirements

- 1 The start-up phase is a particularly critical period that could build a solid foundation for SchoolNet operations, or, on the other hand, lead to early signs of unsuccessful networking.
- 2 There are different models and approaches to initiate and support the start-up phase, and they pose both strengths and weaknesses.

Infrastructure and Computer Configuration in Schools

- 3 Clearly, a good physical and technological infrastructure is necessary for the smooth operation of a SchoolNet. Old PCs tend to malfunction and more technical problems are encountered in schools that have existing PCs compared to those with brand new computers.

Location of Servers

- 4 The location of the servers (i.e. centrally operated and/or located, decentralized, or a blending of the two) poses strengths and weaknesses. Regardless of its location, the server should be upgraded as a SchoolNet expands.

Connectivity Options

- 5 Ease of connectivity encourages schools to join SchoolNets. There are a number of enabling measures that can be adopted, such as free hosting facilities and domain; free Internet connection for the first year; monthly payments at special “educational rates” for the leased line and telephone; and sharing the cost of Internet access between schools and the MOE.

Support from Other Connectivity Sources

- 6 SchoolNets looking for affordable connectivity costs should approach local telecommunications companies to reduce their rates for Internet access and, where applicable, to sell computer equipment and software and applications at discounted prices.

SYNTHESIS OF EXPERIENCES

ISSUE: START-UP PHASE AND MINIMUM CORE REQUIREMENTS

A good physical and technological infrastructure and affordable connectivity pave the way for a smooth start-up phase. During this period, it is ideal to place equal emphasis on technological concerns as well as on skills training and content development.

lesson learned 1

The start-up phase is a particularly critical period that could build a solid foundation for SchoolNet operations, or, on the other hand, lead to early signs of unsuccessful networking.

Indonesia

The Malang city government launched the WAN Kota Project and, recognizing the urgency of the start-up phase, provided basic facilities, personnel resources, infrastructure and budget. In addition, support came from participating schools and district governments. Although modest, contributions from the central government included a small portion of capital investment, teacher training programmes, coordination, monitoring and evaluation. The central government's contribution is less than 20 per cent of the total initial investment.

Malaysia

As early as the start-up phase, the Smart School Pilot Project, a government-

backed venture and a showcase activity, has had the advantage of being provided with new technology infrastructure that included the following: (i) a primary domain controller (PDC) and at least one backup domain controller (BDC), (ii) a directory database for each pilot school and the Data Centre, including such components as organization, servers, volumes, user groups, and printers, (iii) creation of necessary user groups, with at least one sample user account - under each user group - given appropriate access rights, (iv) at least one File Transfer Protocol (FTP) account for each school and the Data Centre in order to access the public directory in a server in the school, (v) file transfer capability from one pilot school to another and between a pilot school and

Data Centre, (vi) a messaging system with sample e-mail accounts for school heads, teachers, students and staff in each school, and (vii) a system to perform unattended (automatic) backups (for backups that do not require tape changes).

Philippines

The start-up phase found Ed.venture opting for a fixed network connectivity model because wireless connectivity was too costly for FIT-ED and some schools had no budget to pay for connectivity.

Each pilot school designated a room to house the Ed.venture Centre. Rooms that did not conform to technical specifications were retro-fitted. Payments for other retro-fitting expenses were shouldered by the schools and/or their community partners, except the rewiring and lighting costs for one school, which were paid by Ed.venture.

Singapore

Although edu.MALL is an integral part of Singapore's MP1 and coordinated by MOE's Educational Technology Division, it has been heavily supported by the business sector right from the start. Run like a business enterprise, edu.MALL provides one-stop access to educational resources and on-line information services for teaching and learning. It relies to a large extent on the expertise, infrastructure and services of the business sector. CHAPTER-E.com, a venture company of the National Computer Systems (NCS) and Panpac Media.com, manages edu.MALL, continually working

on new possibilities to acquire and construct knowledge in creative ways through interactive activities in a learning community.

Thailand

As SchoolNet Thailand arose from a desire to bridge the digital divide by promoting computer and Internet technologies, the emphasis in the start-up phase was to connect schools and share resources. Later on the focus broadened to include training and content development. During the SchoolNet's Formation Stage (late 1995-February 1998), NECTEC developed a LINUX School Internet Server (LINUX-SIS) from LINUX-SIS 1.0 in April 1997 to LINUX-SIS 2.0 in February 1998. LINUX-SIS 3.0 was created in February 1999. LINUX-SIS 4.0 with a Digital Library Toolkit and Easy Library was developed in October 2000. LINUX-SIS was promoted and distributed to schools as a cheaper alternative to using expensive server software. In its first year of implementation, the SchoolNet connected 20 schools, increasing to 1,500 in 1999.

LINUX-SIS has been particularly useful in schools that were ready to move beyond the first phase of Internet implementation. Since its introduction, LINUX-SIS has been very popular in Thailand due to its excellent documentation in Thai, and its simple-to-install CD-ROM and Web-based server management that can be used without the need to know UNIX commands. SIS training courses are in constant demand from schools looking for a reliable Internet server at the lowest cost.

lessonlearned 2

There are different models and approaches to initiate and support the start-up phase, and they pose both strengths and weaknesses.

Thailand

NECTEC approached the start-up phase by addressing the digital divide through the promotion of computer and Internet technologies. The emphasis at that time was on connecting schools and sharing resources. Later on, the focus broadened to include training and content development. During the SchoolNet's Formation Stage (late 1995-February 1998), NECTEC developed a LINUX School Internet Server (LINUX-SIS) from LINUX-SIS 1.0 in April 1997 to LINUX-SIS

2.0 in February 1998. LINUX-SIS 3.0 was created in February 1999. LINUX-SIS 4.0 with Digital Library Toolkit and Easy Library was developed in October 2000.

Philippines

Perhaps the most significant limitation to Ed.venture has been its choice of a fixed network connectivity model during the start-up phase. Given the current state of telecommunications infrastructure in the Philippines, Ed.venture is limited to schools in urban and peri-urban areas.

ISSUE: INFRASTRUCTURE AND COMPUTER CONFIGURATION IN SCHOOLS

In determining computer capacity and the appropriate number of computers that should be linked to a SchoolNet and to the Internet, there are several inter-related factors to be considered: number of existing computers, room size, student population, average class size, and programme budget limitations.

lessonlearned 3

Clearly, a good physical and technological infrastructure is necessary for the smooth operation of a SchoolNet. Old PCs tend to malfunction and more technical problems are encountered in schools that have existing PCs compared to those with brand new computers.

Indonesia

There is a varied range of infrastructure in WAN Kota's clients (i.e. PS, JSS, GSS, and VSS, as well as teacher training centres, universities and local government offices). In some schools, only one or two computers are connected to the WAN Kota, and these are in the principal's office. Other schools have a whole set of up-to-date computers that are connected to the WAN Kota, and are used by teachers and students in the classrooms. The GSS are usually well-equipped, while most of the VSS use old, second-hand computers that are, nevertheless, still running well. Of all the schools, the PS have the poorest computer equipment. As a practice, the best computers, if available, are used for administration purposes only. To make effective use of the WAN Kota, there should be 20 to 40 computers in every school. However, most schools have very limited resources.

To connect one WAN Kota client with another, DTVE in cooperation with a telephone company, Indosat, has recently built on a trial basis an intercity backbone connection using fibre optic and satellite facilities. If this is successful, this facility will be expanded throughout the country, making WAN Kota a wider education network.

The country as a whole faces many problems concerning ICT infrastructure. ICT use is limited to large cities, especially those in the western part of the country. Only around 10 per cent of all schools have access to the Internet and many of these make use of a dial-up ISP connection. There were approximately 10 million Internet users in 2003, or 2 per cent of the total population of 200 million people.

Malaysia

The Smart School Project has connected Smart Schools using both broadband and ISDN, and is now about to embark on its expansion phase. The technology infrastructure that supported the Smart School Network and other components of the Smart School Integrated Solution were determined in negotiations over the terms and conditions of the Smart School Pilot Project Agreement signed between the Government and the consortium. Three technology models were deployed in the pilot project: Level B (Laboratory Model), Level B+ (Limited Classroom Model), and Level A (Full Classroom Model).

Philippines

Each pilot school in Pilipinas SchoolNet has a local area network with 11 to 22 PCs. Two network typologies have been utilized. One network is for schools with no existing servers, and for these, a Linux server has been provided. The other network is for schools with existing servers. Pilipinas SchoolNet has connected 15 pilot schools using a decentralized dial-up Internet access.

Singapore

The ICT infrastructure and connectivity for SchoolNets in these case studies are at different levels of development. At one end of the spectrum is Singapore where 100 per cent connectivity to all schools through a WAN has been achieved and broadband connection is available.

Thailand

Out of approximately 34,000 schools nationwide, some 5,000 schools are connected to the SchoolNet, with Internet dial-up access provided at the rate of a local telephone call.

ISSUE: LOCATION OF SERVERS

Some servers are decentralized to the schools and some operate from a central platform. In the case of some SchoolNets, the servers are a blend of the two models.

lessonlearned 4

The location of the servers (i.e. centrally operated and/or located or decentralized to the schools or a blending of the two) poses strengths and weaknesses. Regardless of its location, the server should be upgraded as a SchoolNet expands.

Indonesia

The most important infrastructure of WAN Kota is its base terminal server (BTS), which has been built using a 32-metre triangular tower, an antenna omni 24 dBi (point to multipoint), an antenna grid 24 dBi (point to point), and a wireless LAN 22 Mbps (access point). Every client within a radius of 10 km is equipped with an antenna grid 24 dBi (point to point) and a wireless LAN 22 Mbps (access point). Depending on the topography and on geographical coverage, one BTS or more are required. To cover 40 clients in Malang City, for example, three BTSs would be required. Internet connectivity using 512 kbps is shared with all clients within the network.

Malaysia

The Malaysian BESTARinet portal was the hub for all the pilot schools, linking them with the Data Centre and the Smart School Pilot Project Team at MOE's Educational Technology Division in Kuala Lumpur. Through the BESTARinet portal, parents, had on-line access to their children's records that are stored in the

Smart School Management System of their children's schools. Three servers handled communications, databases and applications, and these were placed at the Data Centre located at the MOE's Educational Technology Division in Kuala Lumpur. As for the operating system, the following systems were used at the Data Centre: Banyan VINES, IBM OS/2, Warp Server, Microsoft MS-DOS, Microsoft Windows NT Sever, and Novell NetWare.

Philippines

Ed.venture does not have a centralized platform because FIT-ED does not deem this as a cost-effective option for a small-scale pilot. Nevertheless, migrating to a centralized platform will be worth considering when more schools join Pilipinas SchoolNet, and a culture of resource-sharing and on-line collaboration is developed among them. In the meantime, schools that have created school and project websites can continue to make use of free Web hosting services like Geocities. For e-mail accounts, students use free services, such as Yahoo and Hotmail.

Singapore

MP1 provided school-wide networking in every school. It allowed access to courseware, the Internet and digitized media resources in all classrooms and in all learning areas. Networking also facilitated the sharing of teaching resources within and between schools. All schools were linked through a WAN and these were eventually connected to the high-speed backbone of Singapore ONE.

Thailand

The LINUX-SIS was promoted and distributed to schools as a cheaper alternative to using expensive server software. In its first year of implementation, SchoolNet successfully connected 20 schools, increasing by 1999 to 1,500 schools. At the end of 1998, there were 152 secondary schools participating

nationwide, access numbers increased from 39 in late 1995 to 120 in February 1998. LINUX-SIS has been particularly useful in schools that were ready to move beyond the first phase of Internet implementation. Since its introduction, LINUX-SIS has been very popular in Thailand due to its excellent documentation in Thai and its simple-to-install CD-ROM and Web-based server management that can be used without the need to know UNIX commands. SIS training courses are in constant demand from schools looking for a reliable Internet server at the lowest cost. Between May 2001 and June 2002, five dial-up accounts and a disk space of 8MB on the central server were allocated to each participating school as mailbox and Web storage. Each account has approximately 80 hours of use per month.

ISSUE: CONNECTIVITY OPTIONS

The choice of a suitable ISP model depends on the requirements of individual SchoolNets. It is also advisable to try other connectivity options apart from the usual Web-based connection. These include video conferencing, satellite, wireless, and so on. The pros and cons of these options should be carefully studied. Many have found them useful for reaching remote, marginalized areas.

lessonlearned 5

Ease of connectivity encourages schools to join SchoolNets. There are a number of enabling measures that can be adopted, such as free hosting facilities and domain; free Internet connection for the first year; monthly payments at special “educational rates” for the leased line and telephone; and sharing the cost of Internet access between schools and the MOE.

Indonesia

WAN Kota addresses the inadequacy of existing infrastructure and the heavy expenditures for connectivity to link vocational secondary schools within the network. One solution was to develop a wireless wide area network (WAN) using 2.4 GHz radio frequency. WAN Kota is aimed at connecting local area networks built in each school within a city at a very low cost. The pilot project was launched in 2002 in eight cities, with expansion to include 30 other cities proposed during the course of 2003.

Malaysia

Satellite and wireless connection to the Smart School Network was given to some pilot schools located in areas where landlines were lacking or in short supply. Level A pilot schools were given video conferencing facilities which they used to link up with schools in the United Kingdom under the Coventry Project managed by the MOE's Curriculum Development Centre. However, the prohibitive cost of video conferencing sessions forced Level A schools to severely curtail use of the facility. The roll-out plan of the Smart School Integrated Solution, to reach the rest of the schools in the country, will take into consideration Web-based connection as well as video conferencing, satellite and wireless connection.

Singapore

Despite its relatively high connectivity rate, Singapore remains confronted by the issue of the digital divide. While all schools are already on the broadband network, the take up rate for broadband home subscription by students varies: high (over 75 per cent) for some and low for others.

The Internet dial-up penetration rate is about 47.2 per cent in April 2002, or about two million subscribers. The Singaporean Government is committed to bridging the gap, and has allocated S\$25 million to promote PC and Internet awareness and use through collaboration with community groups and voluntary welfare organizations. Moreover, a key initiative was launched in 1999 to benefit 30,000 households with a monthly income of less than S\$2000. These households were provided with used PCs bundled with free Internet access, and were given basic training. Six hardware and software providers and one ISP funded this effort. MOE was the largest donor of used computers.

Thailand

LINUX-SIS was promoted and distributed to schools as a cheaper alternative to using expensive server software. In its first year of implementation, SchoolNet successfully connected 20 schools, increasing by 1999 to 1,500 schools. At the end of 1998, there were 152 secondary schools participating nationwide, access numbers increased from 39 in late 1995 to 120 in February 1998. LINUX-SIS has been particularly useful in schools that were ready to move beyond the first phase of Internet implementation. Because of its excellent documentation in Thai and its simple-to-install CD-ROM, LINUX-SIS has been very popular in Thailand. Its Web-based server management does not require knowledge of UNIX commands. SIS training courses are in constant demand from schools looking for a reliable Internet server at the lowest cost.

ISSUE: SUPPORT FROM OTHER CONNECTIVITY SOURCES

Especially reduced charges for Internet access and discounted prices for computer hardware and software can be negotiated with telephone/telecommunications companies. This will attract more SchoolNet users while also helping to reduce SchoolNet expenditures.

lessonlearned 6

SchoolNets looking for affordable connectivity costs should approach local telecommunications companies to reduce their rates for Internet access and, where applicable, to sell computer equipment and software and applications at discounted prices.

Malaysia

Malaysia's main telecommunications company has proposed a special "educational rate" for telecommunications services rendered to schools and the MOE, to provide Internet access and telephones to 220 remote schools and their surrounding communities in Sabah and Sarawak.

Philippines

Free telephone time and Internet access for one year is provided to schools and a 50 per cent discount is given in the succeeding years. FIT-ED together with DepEd and other NGOs have brokered a deal with leading telecommunications companies, namely Globe-Isia and the PLDT, the country's two biggest telecom companies that are also Ed.venture's connectivity partners.

Singapore

Benefiting from the ICT infrastructure and capability of NCS and the content and pedagogical expertise of Panpac Media.com, CHAPTER-E.com's ability to helm edu.MALL has been further enhanced. CHAPTER-E.com continually explores new possibilities for acquiring and constructing knowledge in creative ways.

Thailand

Arrangements have been made with telecommunications companies and relevant government agencies to designate specific telephone access numbers that SchoolNet members can use to connect to the Internet. SchoolNet members calling from anywhere in the country can access the Internet at the cost of a local telephone call instead of a long distance call.

CURRICULUM INTEGRATION, CONTENT DEVELOPMENT AND KNOWLEDGE MANAGEMENT

component 5



OVERVIEW AND LESSONS LEARNED

Discussions in this component focus on the following issues: curriculum integration, pedagogy, ICT integration and contents of SchoolNet websites. There are appropriate SchoolNet operations that lend themselves as appropriate entry points for responses to these issues. These entry points should be identified and carefully considered.

Based on the experiences of the five countries with respect to curriculum integration, content development and knowledge management under a SchoolNet programme, the following lessons were learned:

Curriculum Integration

1 Curriculum integration is a complex facet of SchoolNet operations that requires experimentation and creativity on the part of teachers who, in the first place, should have received adequate theoretical and practical training in curriculum and courseware development.

Pedagogy and ICT Integration

2 As the pedagogy shifts from being teacher-centred to being student-centred, there is a greater need for teachers to structure the learning experience, and to provide guidance and supervision.

Contents of SchoolNet Website

3 The contents of SchoolNets can be rooted in the mandate of the national ICT policy of individual countries and/or the national curriculum.

4 To ensure relevance and educational value of the contents, particularly material in the national language, content development should be assigned to professional curriculum developers, or alternatively, to subject specialists, qualified teachers, school administrators and students working as members of a team.

SYNTHESIS OF EXPERIENCES

ISSUE: CURRICULUM INTEGRATION

The integration of SchoolNet into the teaching and learning materials of the national or sub-national curriculum enhances the long-term value and viability of a SchoolNet, while also helping to strengthen the implementation of the national policy on ICT use in education. Typically, the subjects most involved are science, mathematics and language. In effect, curriculum integration has made teaching and learning through SchoolNets more interesting and appealing.

lesson learned 1

Curriculum integration is a complex facet of SchoolNet operations that requires experimentation and creativity on the part of teachers who, in the first place, should have received adequate theoretical and practical training in curriculum and courseware development.

Indonesia

The toughest task for teachers working on SchoolNets was to design and develop ICT-based lessons. To ease the problem, further training in interactive multimedia technology, in addition to training in computer technology and the Internet, was conducted for VSS teachers. The topics covered included graphic design, sound, video and storyboard, tools and peripherals for multimedia acquisition and presentation.

Malaysia

Teachers, educators and MOE officials, collaborating as courseware development consultants, have been largely responsible

for integrating teaching and learning materials used in the Smart School Network into the national curriculum. During negotiations for the pilot project agreement, the MOE required a one-to-one matching of courseware with curriculum specifications in response to teacher insistence that anything that departed from the curriculum would not be useful in the classroom. Courseware for Bahasa Melayu, English language, science and mathematics was developed according to specifications in the national curriculum for these four subjects.

The Smart School Pilot Project also demonstrated that in order to foster

greater use of SchoolNet materials by teachers and students, it is imperative that these materials are in line with the national curriculum.

Philippines

Through professional development workshops, teachers learn how to create structured lessons and projects in specific learning areas, such as science, mathematics, English, Pilipino (the

national language) and social studies. They also learn how to integrate lessons across different learning areas in the curriculum, and how to design inquiry-based activities, such as on-line treasure hunts, Webquests and telecollaborative projects. Starting in 2003, curriculum integration training for teachers and post-training pedagogical support have been intensified.

ISSUE: PEDAGOGY AND ICT INTEGRATION

A sound pedagogy provides a viable basis for SchoolNet lessons and materials. It has been observed, however, that heavy teaching loads leave little time for teachers to practice their pedagogical skills and prepare ICT-based lessons and projects. Therefore, a role is seen for support networks among teachers within individual schools to encourage school-wide, as well as school-to-school, collaboration in preparing properly structured lessons.

lessonlearned 2

As the pedagogy shifts from being teacher-centred to being student-centred, there is a greater need for teachers to structure the learning experience, and to provide guidance and supervision.

Malaysia

The integration of pedagogy and ICT in the Smart School Network is seen in the way that the Internet has been used as an alternative source of information for assignments and projects, and as a means to teach a higher level of thinking skills, such as analysis of information for accuracy and truth. A great deal of collaboration among school heads, teachers and students of the pilot schools has come about as a result of their increased capability to communicate with their counterparts in other pilot schools, non-pilot schools and schools in other countries.

Philippines

The experience of Pilipinas SchoolNet points to the need to correct a common misconception among the teachers that using the Internet as an instructional tool simply means assigning a topic for students to search on-line without any guideline or supervision. The teachers need to understand that “learning by doing” or encouraging the students to “explore” does not mean that activities should be unstructured. On the contrary, as the pedagogy shifts from being teacher-centred to being student-centred, the teachers need to structure the learning experience by providing a framework, formulating guide questions, recommending websites, facilitating discussions, and so on.

ISSUE: CONTENTS OF SCHOOLNET WEBSITE

Good local contents have a high educational value and are supportive of the school curricula. The contents undergo strict quality control to ensure that they are useful and relevant. Ideally, feedback from the teachers and students is solicited and used as a basis for further improvement of the contents.

lessonlearned 3

The contents of SchoolNets can be rooted in the mandate of the national ICT policy of individual countries and/or the national curriculum.

Malaysia

The national curriculum provided the basis for the development of contents and teaching and learning materials for BESTARnet, the portal for the Smart School Pilot Project. BESTARnet is used mainly by school heads, teachers and students of the Smart School Pilot Project, as well as by parents and by officers of the Smart School Development Team. The different sections of BESTARnet are now being reviewed and redesigned.

Philippines

The development of contents for teaching and learning materials of Pilipinas SchoolNet was based on the national curriculum and was the result of expert teamwork. The materials are rich in

interactive, pedagogy-based lessons and classroom activities.

Singapore

As edu.MALL comes under a larger government initiative (i.e. the ICT Master Plan), its contents have been selected and developed taking into account the objectives of MP1. Thus, in support of MP1, the contents offer a wealth of information and provide ICT-based tools that enable the teachers to build lesson plans and explore the best ways to integrate ICT in their lessons. The contents cover areas like ICT teaching and learning resources, a showcase of collaborative and research projects on the use of ICT in education, professional development, infrastructure and support, innovative projects and good practices.

lessonlearned 4

To ensure relevance and educational value of the contents, particularly material in the national language, content development should be assigned to professional curriculum developers, or alternatively, to subject specialists, qualified teachers, school administrators and students working as members of a team.

Malaysia

The contents of the Smart School Pilot Project were basically initiated and updated by the Smart School Development Team, which was composed of subject and technical specialists, and assisted by teachers and students to ensure that the needs of various users were properly reflected.

Philippines

The content contributors were mostly teachers from Pilipinas SchoolNet. Some students were asked to help in designing curriculum integration activities, and in developing materials to assist the teachers. Rich in interactive, pedagogy-based lessons and classroom activities, the contents of Pilipinas SchoolNet featured an on-line treasure hunt and Webquests, both of which are inquiry-based.

Singapore

SchoolNet contents have been generated by a multi-sectoral group of teachers, subject specialists and commercial

content developers. In addition to developing SchoolNet contents, technical experts and commercial companies established links to existing sites. The materials posted are in English and in the national language.

Thailand

The first major contributors of content for Thailand SchoolNet were teachers, students and heads of schools within the network. As their inputs proved inadequate, however, the participation of experts and subject specialists in other departments and sectors in the MOE, as well as students, was tapped. In 1998, the SchoolNet Content Development Project, called Digital Library, was commissioned to Kasetsart University in conjunction with the Institute for the Promotion of Teaching Science and Technology. The Digital Library has become a repository of Thai-based teaching/learning lessons contributed by a university and science centre-based team, and later on, by teachers and students.



OVERVIEW AND LESSONS LEARNED

Discussions within this component cover help-desks, troubleshooting, and maintenance.

Based on the experiences of the five countries with respect to services under a SchoolNet programme, the following lessons were learned:

Help Desk

- 1 An efficient Help Desk is one that (i) has the right number of qualified staff to carry out a wide range of technical duties and responsibilities, (ii) offers staff training and (iii) provides a network management framework to ensure the smooth flow of responses to enquiries, offers of assistance and data storage.

Troubleshooting and Maintenance

- 2 Since many SchoolNet members do not have the capability for troubleshooting and maintenance services, these can be outsourced. However, it is desirable to offer training and to build capacity for adequate and autonomous maintenance work.

SYNTHESIS OF EXPERIENCES

ISSUE: HELP DESK

A SchoolNet's Help Desk serves as a one-stop centre that handles inquiries concerning network operations; responds to requests for assistance; and guides users on how to upload, navigate and search for information on the SchoolNet.

lesson learned 1

An efficient Help Desk is one that (i) has the right number of qualified staff to carry out a wide range of technical duties and responsibilities, (ii) offers staff training and (iii) provides a network management framework to ensure the smooth flow of responses to enquiries, offers of assistance and data storage.

Indonesia

A Help Desk is one of the services provided by WAN Kota to help improve the quality of on-line teaching and learning. The Help Desk is able to offer assistance in matters related to e-mail, mailing lists, newsgroups and technical support.

Malaysia

The Smart School Help Desk covered inquiries concerning the Smart School Integrated Solution and components. Help Desk personnel during the pilot project were provided by the consortium and included one Support Services manager, one Help Desk executive, one Help Desk supervisor, eight operators, one network

executive, one programmer, three administrative assistants, one application specialist team leader and six application specialists. A comprehensive systems and network management framework was used, including strategies; tools; standards; procedures and workflows; and organization and training programmes for Help Desk personnel.

A proprietary 'FOCUS' system was used as central database for the Help Desk to record and store all maintenance details (including a bug resolution log, all maintenance activities, fault classifications and clearance procedure details). The Help Desk was able to operate effectively

based on its service level agreement with the Government, but only on problems that could be solved by the consortium.

The Help Desk can be reached by telephone via a 1-300-xxx number (callers pay local charges for calls made from

anywhere in Malaysia), e-mail, Internet, fax, and postal mail. The operating hours of the Help Desk in all states are between 8.00 a.m. and 6.30 p.m., Monday to Sunday (excluding national public holidays).

ISSUE: TROUBLESHOOTING AND MAINTENANCE

Troubleshooting and maintenance services are rendered to schools belonging to a SchoolNet based on especially drawn-up service delivery schemes. Quick response to maintenance problems is highly desirable as it helps to maintain the interest of the SchoolNet's stakeholders and/or users.

lesson learned 2

Since many SchoolNet members do not have the capability for troubleshooting and maintenance services, these can be outsourced. However, it is desirable to offer training and to build member capacity for adequate and autonomous maintenance work.

Indonesia

For WAN Kota clients, numbering between 10 and 40 schools per city, troubleshooting and maintenance services are provided at a cost. Payments for regular maintenance and operational expenses can be built into the annual clients' contribution of around US\$300 per client. Taking into account the number of the network's ultimate beneficiaries (i.e. students), the cost is around 30 US cents per student per month.

Malaysia

To handle requests for help concerning equipment, infrastructure and connectivity, each pilot school has a designated guide from the Smart School Team. However, not all members of the team have the kind of technical expertise to handle problems related to equipment, infrastructure and connectivity. Before the end of the pilot project, ten joint MOE-consortium teams visited all the pilot schools to deal with technical problems, and also to help resolve personnel problems.

More ICT-competent educators and systems analysts are being trained to handle the technical aspects of the Smart School Network. Interestingly, some troubleshooting between the pilot schools are being handled through the Smart School Network community. Most of the communications between the Smart School Development Team members, and between the team and the schools, are now being done through e-mails.

Philippines

For the most part, the pilot schools lack sufficient technical know-how, and while the CMs and ACMs are knowledgeable, some do not have any experience in LAN maintenance. However, technical support training is being provided to build school capacity for autonomous maintenance, i.e., the local staff provides first-line troubleshooting and maintenance, and arrangements with external service providers are optimized. The following areas are covered: PC troubleshooting (hardware and software), network

administration, software installation and configuration and network security. A special manual developed by CITE for Ed.Venture Centre managers includes standard operating procedures, among other topics. Although some schools are still weaker than others in terms of technical skills, the general reliance on CITE and FIT-ED for technical support (via phone, e-mail, or actual school visits) has been reduced over the past year. Some

schools have contracted trained technicians to provide technical support. In some cases, local technicians paid for by the school assist in-house technical personnel.

Intensive one-on-one instruction for CMs and ACMs has also been conducted. The strategy of individualized training was devised to speed up the acquisition of skills after initial training.

TEACHER AND PERSONNEL TRAINING

component **1**

online

OVERVIEW AND LESSONS LEARNED

Discussions within this component cover the following issues: skills needed; preparatory skills training at the pre-service and in-service levels; and teacher incentive and motivation after training.

Through professional development courses, teachers gain knowledge and skills to create structured lessons and projects in specific learning areas and/or projects that integrate lessons across different learning areas in the curriculum. Training for personnel, on the other hand, should cover skills required for the day-to-day running of the SchoolNet, as well as for providing technical support to users. Both teachers and network personnel should possess an adequate level of computer literacy, as well as knowledge of computers and the Internet, to ensure the smooth operation of the SchoolNet.

Based on the experiences of the five countries with respect to the training of teachers and personnel under the SchoolNet programme, the following lessons were learned:

Skills Needed

- 1 Regardless of from where training emanates, it should satisfy the needs of networking operations. Often, in the case of SchoolNets that are an integral part of government policy on ICT in education, training emanates from the MOE or other relevant government agencies. On the other hand, SchoolNets that do not fall within the MOE programme may take the initiative to conduct their own training activities.

Teacher Incentives and Motivation after Training

- 2 An incentive scheme to keep teachers interested and motivated is highly desirable. Such a scheme could go a long way in raising teacher morale, which could be dampened by unfamiliarity with ICT and slow uptake of ICT skills, restrictions placed on local on-line learning materials that can be accessed through the Internet, and the high cost of Internet connections.

SYNTHESIS OF EXPERIENCES

ISSUE: SKILLS NEEDED

The skills required of teachers and personnel should correspond to the different demands of the networking operations and should cover tasks that are carried out in the day-to-day management and operation of the SchoolNet, including providing technical support to users.

lesson learned 1

Regardless of from where training emanates, it should satisfy the needs of networking operations. Often, in the case of SchoolNets that are an integral part of government policy on ICT in education, training emanates from the MOE or other relevant government agencies. On the other hand, SchoolNets that do not fall within the MOE programme may take the initiative to conduct their own training activities.

Indonesia

The experience of WAN Kota has shown that human resources development is strategic to the promotion of ICT use in education, in general, and to the operation of SchoolNets, in particular. Teachers and professional staff should be trained and equipped with skills that will enable them to work with a high level of competence complemented by a healthy attitude towards ICT.

The country is challenged by massive training needs, as indicated by the large number of schools and educational institutions that need government

assistance for ICT infrastructure and human resources development. To date, competent human resources in the field of information and communications technologies are limited, in terms of quantity and quality. Most of the available ICT professionals opt to work in the business sector.

Malaysia

To satisfy the skills requirement of the Smart School Pilot Project, the Smart School Pilot Project Agreement provided for skills training for officers from the Smart School Team and selected teachers from the pilot schools. The

training covered the following courses: Windows 98 Applications, Hardware/Software Concepts, Introduction to Office 2000 Applications, Word Processing Application (MS Word), Spreadsheet Application (MS Excel), Presentation Application (MS PowerPoint), Fundamental Networking Concepts, Logging on to the School Area Network, Internet and E-mail Access, System and Peripheral Operations, Equipment Installation, Preventive Maintenance, and Remedial Maintenance, Problem Escalation, and Windows NT Administration.

Philippines

As Ed.venture is outside the MOE programme, training activities in the main are directly linked to the needs of the SchoolNet, and have emanated from the project itself. Beyond basic computer literacy, Ed.venture has organized training for ICT integration into the curriculum and in telecollaboration. Training is being provided on a continuing basis. Beginning in June 2003, CMs/ACMs have been given reduced teaching loads. Also in 2003, curriculum integration training for teachers has intensified and post-training pedagogical support has been provided.

The experience of Pilipinas SchoolNet points to a number of lessons, such as the need to conduct comprehensive, continuous and flexible training; provide sufficient access to the ICT facility in order to practise newly acquired skills; and identify “champion” teachers who will form the critical mass of school

innovators and who will drive the programme forward.

Singapore

Skills in posting, sharing and accessing information as required by edu.MALL were immediately provided by the staff as their previous training under the Master Plan has been intensive and comprehensive. Thus, there has been no need to organize separate training activities on school networking and on using edu.MALL.

In many ways, Singapore is way ahead of all the countries in the case studies. It has developed teachers' knowledge and skills in authentic integration of ICT use in subject teaching, particularly in mathematics, science, English and humanities. In addition, Singapore has conducted training in the use of ICT-based pedagogical principles and skills, such as “Constructivist Learning with the Internet” and “Instructional Multimedia Design.”

Thailand

For the most part, the subject matter of training conducted by the SchoolNet itself depends on the project's training needs and priorities. In its early years, Thailand SchoolNet focused its training activities on skills needed to use the Internet and to develop Web pages and websites, and were directly linked to SchoolNet needs. Teachers and students were trained to make the best use of the Internet, to manage their own information, and to serve as trainers for other schools in the provinces.

ISSUE: PREPARATORY SKILLS TRAINING AT THE PRE-SERVICE AND IN-SERVICE LEVELS

Indonesia

Teacher training is given a high priority. When an IT programme was introduced to VSS, at least two teachers per school were sent for training at Vocational Teacher Training Centres. They were required to pass an examination administered by independent agencies, the Association of ISPs and Bandung Institute of Technology, in order to receive their certificates. When computer networking was introduced in the VSS curriculum, a number of teachers were also prepared beforehand. They were required to hold Cisco certificates to qualify as teachers. Other training programmes included introduction to interactive multimedia technology. The central government has set aside some funds to support the graduate training programme for teachers within the country and overseas.

As ICT-based course design and development have been the toughest task for all teachers working on SchoolNets, it stands to reason that these two areas are priority components in skills training. Having introduced the teachers to computer technology and the Internet in 1999, DTVE commissioned training programmes for a number of VSS teachers on interactive multimedia technology. The teachers were trained in graphic design, sound, video and storyboard; tools and peripherals for multimedia acquisition and presentation; and the production of interactive multimedia learning packages on CD-ROM.

Malaysia

The MOE's Teacher Education Division conducted preparatory skills training for

teachers at the pre-service and in-service levels. It concentrated on basic computer literacy skills - such as word processing, presentations, and spreadsheets - and basic ICT integration. However, these skills were not directly linked to effective participation in the Smart School Network.

Philippines

Preparatory skills training at the pre-service and in-service levels covers Instructional Use Training, Technical Support Training and Educational Technology Management Training.

Instructional Use Training consists of three phases. Phase I (Basic Computer and Internet Skills) is delivered for teachers in partnership with UPOU and the University of Cebu. It focuses on computer fundamentals, productivity tools, Web search, and e-mail. Phase II (Information Literacy and Telecollaborative Learning) builds on fundamentals learned in Phase I. Its initial focus is information literacy, followed by telecollaborative learning and the telecollaborative project cycle. Participant outputs are telecollaborative project designs that are ready for implementation. In Phase III (ICT and Curriculum Integration), participants produce on-line treasure hunts and Webquests for specific lessons in the curriculum covered by the E-Learning Club project. Emphasis is also placed on formulating rubrics for assessing student performance in each activity.

Technical Support Training builds the school's capacity for autonomous maintenance, i.e., the local staff provides first-line troubleshooting and maintenance, and arrangements with external service providers are optimized.

The following areas are covered: PC troubleshooting (hardware and software), Network Administration, Software Installation and Configuration and Network Security.

Educational Technology Management Training for school administrators focuses on curriculum integration planning, business modeling, community mobilization and partnership building.

ISSUE: TEACHER INCENTIVES AND MOTIVATION AFTER TRAINING

Having provided training to build teacher knowledge of and confidence in using ICT-based resources and producing lesson plans, there is a need to sustain their interest and keep them motivated. This can be done through an incentive scheme with a wide range of offerings, including additional training, sharing of resources, self-instructional packages and self-taught training mechanisms in the form of books, videos and CD-ROMs.

lesson learned 2

An incentive scheme to keep teachers interested and motivated is highly desirable. Such a scheme could go a long way in raising teacher morale, which could be dampened by unfamiliarity with ICT and slow uptake of ICT skills, restrictions placed on local on-line learning materials that can be accessed through the Internet, and the high cost of Internet connections.

Malaysia

The advantages of introducing a teacher incentive and motivation scheme are recognized, and these will be addressed in the roll-out plan for the Smart School Project.

Philippines

The inability of many teachers to fully implement their telecollaborative projects demonstrated the potential usefulness of an incentive scheme that will sustain their

interest and keep them motivated after their training. Of the 138 teachers implementing telecollaborative projects, 94 completed project activities in their respective classes but were unable to interact with their counterparts from other schools. Many teachers were not used to collaborating with each other, particularly in cases where e-mail was their only means of communication. The teachers should be motivated to make regular use of e-mail exchanges and to learn to cope

with technical difficulties, including slow Internet connection - especially during peak hours - and LAN problems that may cause downtime. A reward system could be built into the programme to keep teachers motivated. In the longer term, the MOE and other partners can be urged to institutionalize an incentive system to reward teachers for their hard work and ICT-related innovations.

Thailand

In a manner of speaking, the SchoolNet Content Development Project “Digital Library” has helped to motivate teachers to exchange ideas, and in turn, paved the way for the creation of educational websites in Thai. These sites deal with such academic subjects as computer science, mathematics, physics, chemistry, biology, engineering and the environment. The development of good local content also sustains the interest of teachers and students to engage in on-line teaching and learning.

RESEARCH, MONITORING AND EVALUATION

component 8



OVERVIEW AND LESSONS LEARNED

Discussions within this component cover the following issues: research, monitoring and evaluation strategy and data, key performance indicators and how to collect evidence of success. To be sure, current achievements in networking operations speak of the potential for further successes.

Based on the experiences of the five countries with respect to research for, and monitoring and evaluation of, the SchoolNet programme, the following lessons were learned:

Research, Monitoring and Evaluation Strategy and Data

1 Contributions made to date by SchoolNet ventures, as well as current gaps and inadequacies in their operations, should be researched, monitored and evaluated to provide a basis for future improvements and expansion.

Key Performance Indicators

2 To determine the success of SchoolNet operations, a set of key performance indicators is developed and applied accordingly.

How to Collect Evidence of Success

3 Research, monitoring and evaluation are the pillars of a SchoolNet operation, and a good starting point is to collect evidence of success.

SYNTHESIS OF EXPERIENCES

ISSUE: RESEARCH, MONITORING AND EVALUATION STRATEGY AND DATA

The successes and failures of school networking in the countries included in these case studies demonstrate the critical need for research, monitoring and evaluation.

lesson learned 1

Contributions made to date by SchoolNet ventures, as well as current gaps and inadequacies in their operations, should be researched, monitored and evaluated to provide a basis for future improvements and expansion.

Philippines

Various strategies have been used to research, monitor and evaluate Pilipinas SchoolNet, and to collect relevant quantitative and qualitative data from the field. A number of tools have also been developed to facilitate monitoring and evaluation.

The strategies include placing CMs and ACMs in electronic mailing lists; maintaining log books and journals to track pertinent details of day-to-day operations;

visiting schools and conducting structured interviews with school administrators, CMs, ACMs, and teachers; submitting reports on each site visit; preparing post-training evaluation reports; preparing statements of pre-operational costs and summaries of centre-related monthly expenditures; archiving all offline and online communications and outputs related to curriculum integration activities; developing and utilizing new tools to document the experiences of e-learning clubs, and so on.

ISSUE: PERFORMANCE INDICATORS

SchoolNet performance can be measured against quantitative performance indicators that cover ICT diffusion, teacher adoption and learner impact.

lessonlearned 2

To determine the success of SchoolNet operations, a set of key performance indicators is developed and applied accordingly.

Philippines

The performance indicators for Pilipinas SchoolNet take into account the number of trained teachers and school administrators; hours of centre use for

educational purposes; completed telecollaborative projects, on-line treasure hunts, Webquests and e-learning club projects; and the corresponding number of participating teachers and students.

ISSUE: HOW TO COLLECT EVIDENCE OF SUCCESS

Claims of successful networking operations should be substantiated. To do this, indicators of success should be gathered and evaluated.

lessonlearned 3

Research, monitoring and evaluation are the pillars of a SchoolNet operation, and a good starting point is to collect evidence of success.

Philippines

The task of gathering evidence of Ed.venture's success has been initiated despite a number of difficulties. These difficulties have arisen from the initial confusion among schools concerning proper logging of data on Ed.venture Centre; lack of conscientiousness on the part of some CMs and ACMs to document the day-to-day operations of their respective Ed.venture Centres; and inability of school administrators and teachers to develop the habit of checking their e-mails regularly to document their ICT-enhanced activities and to submit progress reports on a regular basis.

Ed.venture has to resolve how and when to assess learner impact. Interviews and focused group discussions with teachers and students attest to the positive impact of ICT integration on learner engagement. Under study are an assessment design to determine whether students actually learn more and/or better with ICT and the tools that will enable rigorous

measurement. FIT-ED believes that reasonable answers can only be obtained when the ICT-based programme has reached a certain level of maturity. Meanwhile, teachers can make use of alternative assessment methods and tools in evaluating individual learning activities, such as treasure hunts, Webquests and telecollaborative projects.

The experience of Pilipinas SchoolNet has shown the need to make research, monitoring, and evaluation a cornerstone of the programme; to consult best practices in research, monitoring and evaluation; to approach the programme in a comprehensive manner; to describe and analyse every aspect of the programme; and to develop appropriate monitoring and evaluation tools. There is a need to effectively communicate to all concerned the importance of research, monitoring and evaluation so that what works and what does not can be carefully screened and segregated.

Component 1

Component 2

Component 3

MANAGEMENT,
ORGANIZATIONAL STRUCTURE,
PARTNERSHIP AND FINANCIAL
STABILITY

INFRASTRUCTURE AND
CONNECTIVITY

CURRICULUM INTEGRATION,
CONTENT DEVELOPMENT AND
KNOWLEDGE MANAGEMENT

Component 4

Component 5

Component 6

SERVICES

TEACHER AND
PERSONNEL TRAINING

RESEARCH, MONITORING
AND EVALUATION

Component 7

Component 8

Component 9