schoolnet *toolkit*

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Preface for schoolnet toolkit

This toolkit arose from the need to provide a recipe book or a blueprint for the pilot schools of the UNESCO project to establish or strengthen schoolnets in Southeast Asia at the national and sub-regional levels. The project entitled, "Strengthening Use of ICTs in Schools and Schoolnet in Southeast Asian Countries", funded by the Japanese Funds in Trust and the ASEAN Foundation, is aimed at: a) exploring and demonstrating how ICT can be used in schools to improve the quality of education and better prepare youth for the demands of the Knowledge Society; b) testing innovative models of ICT use in schools and in other places of learning; and c) improving connectivity and access to the wealth of educational resources through the establishment of a SchoolNets in Southeast Asia. It will establish or strengthen national schoolnet in eight countries (Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Vietnam) as well as connect them to a sub-regional schoolnet hub.

In Asia and the Pacific, a number of countries that includes Australia, India, Indonesia, Malaysia, the Philippines, South Korea, and Thailand, have established national schoolnets . Experts from several of these countries were commissioned to document their experiences in school networking. The cornucopia of experiences, tested strategies, best practices, and lessons learned arising from these case studies provide information which can be translated into a handy and practical set of do's and don'ts useful to those about to embark on a similar initiative or in the process of upgrading their existing SchoolNets. The UNESCO Asia and Pacific Regional Bureau for Education and the Commonwealth of Learning have seized this opportunity of turning these experiences and lessons learned into do-able and practical toolkit for establishing viable SchoolNets. This toolkit is meant for countries at various stages of development. Regardless of the stage of development, all will benefit from the toolkit as it offers guidelines tailor-made for those in different stages with different needs.

This toolkit is the first of its kind and a trailblazer not only in Asia and the Pacific but also throughout the world. It is a convergence of all that is good in school networking. SchoolNets have accelerated technology-based modernization of the education systems and schools. They have helped address the digital divide by mobilizing the telecommunication and IT sector to reduce telecommunications costs and offer free Internet connections through various arrangements. This has led in expanding the number of schools which can make telephone calls and connect to Internet; lowering student-computer and teacher-computer ratios; and enhancing the accessibility of teachers and students to computers through more open access areas and local- area and wide-area networking. Schoolnets have also networked educators and communities that otherwise have neither the tools nor the time and money to get together to connect for dynamic partnerships. They have therefore strengthened skills in collaborating and working in teams through their various telecollaboration activities and projects both at the national and global levels.

More information about the toolkit is given in the Introduction. I wish here to give credit to a number of people and institutions who have contributed to the completion of this toolkit. First and foremost, I would like to thank the Commonwealth of Learning which has contributed to the birth of this toolkit through its valuable support as a co-publisher and as a funder for its preparation and editing.

The primary author is Stephen Marquard, an ICT consultant specialising in applications of ICT in education and online learning and collaboration, with over a decade of experience in school networking and the educational application of ICT. Since starting the first school network in South Africa in 1993, he has subsequently worked with other national and regional Schoolnets in Africa in areas such as connectivity and network solutions for schools, e-learning programmes for teachers, projects addressing the digital divide in disadvantaged schools, the design of school intranets, online collaborative learning, and national educational ICT programmes and policies.

As mentioned, the toolkit derives from a collection of lessons learned and best practices from selected countries in the region which provides the basis for the principles, theories and guidelines presented in the toolkit. For this, we are grateful to the following authors:

- Okhwa Lee, Okhwa. *ICT Integration in Education in South Korea.*
- Cher Ping Lim, *ICT Integration into Education and Schoolnet Operations: A Case Study of Singapore.*
- Chan Foong Mae, *Case Study of ICT Integration into Education.*
- Chan Foong Mae, *Schoolnet Operations in Malaysia: The Malaysian Smart School Project.*
- Victoria Tinio, *ICT Integration in Education in the Philippines.*
- Victoria Tinio, *Ed.venture – the Pilipinas SchoolNet Pilot: A Case Study.*
- Pornpun Witayangkoon, *Case Study of ICT Integration into Education in Thailand.*
- Harina Yuhety, *Case Study of ICT in Schools and Schoolnet in Indonesia.*

The development and publication of the toolkit was coordinated by Carmelita Villanueva, Chief of the UNESCO's Information Programmes and Services and Coordinator of the Project. She also gave valuable comments for its improvement. Thanks also go to Vis Naidoo, Education Specialist, Educational Technology, Commonwealth of Learning; Shafika Isaacs, Executive Director of Schoolnet Africa; Tinsiri Sribodhi, Project Assistant of the UNESCO ICT for Education Team, who all contributed their comments and suggestions that led to the refinement of the toolkit. Last but not least, thanks goes to Ruth Wilson from Commonwealth of Learning who edited the document.

For the value added offered by schoolnets to educational systems, we hope you find the toolkit useful.

Sheldon Shaeffer
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UNESCO Asia-Pacific Regional Office for Education

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Introduction

Welcome to the *Schoolnet Toolkit*. The *Toolkit* is designed to help education planners and practitioners integrate information and communication technologies (ICTs) into education systems.

Education systems are under the spotlight worldwide today. Many countries are grappling with significant development challenges, such as meeting UNESCO's Education for All goals, as well as other social objectives. The information age is creating economic pressure for countries to develop into knowledge societies in order to become or remain internationally competitive in a global economy.

ICTs can help address these challenges. They are an important catalyst for transforming education, creating exciting new possibilities for teaching and learning, and facilitating shifts towards new pedagogies.

A number of Southeast Asian countries have contributed their experiences to this *Toolkit,* which is a practical resource about ICTs in education, and more specifically about setting up and operating schoolnet programmes and projects. A schoolnet programme is an organised set of activities that expands the use of ICTs and promotes sharing of educational resources by teachers and students at schools. Schoolnet programmes may be located inside or outside government, may be large initiatives with substantial funding, or smaller innovative projects without big budgets.

Schoolnet projects usually adopt a multifaceted approach, addressing technology issues (connectivity and infrastructure), curriculum integration processes, assessment and pedagogy, the professional development of teachers, identifying and developing suitable content and software, and creating online communities of practice using ICTs. Schoolnets may also be involved in reshaping the policy environment through advocacy, research, or support of policy processes underway.

The exact form of schoolnet programmes varies from country to country. Nevertheless, the case studies on which the Toolkit is based show substantial convergence towards a body of best practice in ICT integration in education.

The *Toolkit* distils these experiences into a clear and simple format, of use to both start-up and mature schoolnet programmes.

Who is the Toolkit for?

The *Toolkit* is for:

▶ **Policymakers and high-level managers** who need to understand the policy and macro issues involved in planning and establishing schoolnets and educational ICT programmes.

▶ **Schoolnet builders and managers** who are involved in starting and running schoolnet programmes and projects

▶ **Practitioners** such as teachers, school principals and content developers who work with ICTs in an educational context and participate in schoolnet activities

How to Use the Toolkit

The *Toolkit* is structured into four main sections, designed with different readerships in mind:

▶ *Guidebook*1: **ICTs in Education and Schoolnets** is intended for *everyone*. It describes the value proposition for ICTs in education, and the broad processes that need to be integrated to ensure sustainable impact. It looks at the characteristics of schoolnet programmes, different organisational and leadership models for schoolnets, and outlines a variety of functions that schoolnets perform and services that they can deliver. Lastly, it presents ways of assessing the effectiveness of schoolnet programmes, and gives some examples of active schoolnets.

▶ *Guidebook*2: **Planning Schoolnet Programmes** is intended for *policymakers and high-level managers*, and for *schoolnet programme managers*. It examines the policy and planning implications of schoolnet programmes, such as relating ICT programmes to broader economic and education development goals; understanding the financial and other resources that will be required and working within a range of constraints; establishing appropriate partnerships; and change management strategies. It describes ways in which the education system should respond to the introduction of ICTs, such as changes in curriculum structure, assessment strategies and professional development programmes for teachers. Lastly, it looks at factors that influence sustainability at various levels, broadening and extending the impact of schoolnet programmes and methods of evaluating and assessing impact.

▸ *Guidebook*3: **Implementing Schoolnet Programmes** is a practical and operational guide for *managers of schoolnet programmes*, covering project planning and implementation and the key elements involved in an ICT project; choosing appropriate technologies; putting in place support, maintenance and troubleshooting systems; models of training provision; creating and operating online services; creating schoolnet communities; and indicators for measuring participation and impact.

▸ *Guidebook*4: **Practitioner's Guide** provides pointers on ICT integration for *educators, school management, and others* directly involved in producing or using educational ICT resources in a school context. It covers the ICT integration process, changing ways of assessing learning outcomes, selecting, using and adapting ICT software and resources, collaborating with other educators in online communities, and skills and competencies that teachers should build through professional development programmes.

Finally, there are two appendices which may be consulted for further detail and references to source and follow-up material:

▸ Abbreviations, Acronyms and Glossary

▸ References

The toolkit and additional resources are available on CD, and can also be accessed online at the URL: http://wwwunescobkk.org/education/ict/resource/JFIT/schoolnet/toolkit.html

Country Case Studies

The *Toolkit* has been compiled based on the following case studies:

▸ **Korea**: Review of ICTs in education, documenting the development of Korea's infrastructure for ICT use from 1997 to the construction and operation of EDUNET run by the Korea Educational Research Information System.

▸ **Indonesia:** Review of ICTs in education and three different schoolnet initiatives: e-dukasi.net (an online content resource site), WAN Kota (a wide-area network for schools) and Sekolah2000 (a private-sector initiative).

▸ **Malaysia**: Review of ICTs in education and schoolnet operations, focusing on the Smart School Pilot Project implemented in 87 schools from 1999 to 2002 by the Ministry of Education in collaboration with the Multimedia Super Corridor initiative.

▸ **Philippines**: Review of ICTs in education and a case study of the ongoing Coca-Cola Ed.venture project, launched in 2001 and implemented in 15 schools by the Foundation for IT Education and Development.

▸ **Singapore**: Review of developments from the first Singapore Masterplan for ICTs in Education in 1997 (MP1) to the transition to the second Masterplan (MP2) in 2002, including a range of multilateral support programmes, and the teachers' portal and resource site edu.MALL.

▸ **Thailand**: Review of ICTs in education, documenting the progress made by multiple agencies such as NECTEC and the Ministry of Education, the establishment and evolution of Thailand's SchoolNet from 1995 to 2003, and the role of organisations such as IPST in generating online content resources.

Abbreviations, Acronyms and Glossary

Abbreviations and Acronyms

APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BECTA	British Educational Communications and Technology Agency
COL	Commonwealth of Learning
EMIS	Education management information systems
ICT	Information and communication technology
IPR	Intellectual property rights
ITU	International Telecommunication Union
JFIT	Japanese Funds in Trust
K–12	Kindergarten to grade 12
LoTI	Levels of Technology Integration (Framework)
NCREL	North Central Regional Educational Laboratory (USA)
NGO	Non-governmental organisation
NETS-T	National Educational Technology Standards for Teachers
OECD	Organisation for Economic Co-operation and Development
SEAMEO	Southeast Asian Ministers of Education Organization
STaR Chart	School Technology and Readiness Chart
SWOT	Strengths, weaknesses, opportunities and threats (analysis)
UNESCO	United Nations Education, Scientific and Cultural Organization

Indonesia

Pustekkom	Center for Information and Communication Technology for Education

Korea, South

EDUNET	Korean Educational Network
KERIS	Korea Education and Research Information Service

Malaysia

COINS	Corporate Information Superhighway
MDC	Multimedia Development Corporation
MSC	Multimedia Super Corridor
SSIS	Smart School Integrated Solution

SSMS	Smart School Management System

Philippines

DepEd	Department of Education
FIT-ED	Foundation for IT Education and Development

Singapore

EDB	Economic Development Board
ETD	Educational Technology Division (MOE)
ETRC	Educational Technology Resource Centre
IDA	Infocomm Development Authority
KRDL	Kent Ridge Digital Labs
MOE	Ministry of Education
MP1	Masterplan for ICT 1
MP2	Masterplan for ICT 2
NCB	National Computing Board
NCS	National Computer Systems
NIE	National Institute of Education

Thailand

CAT	Communications Authority of Thailand
IPST	Institute for the Promotion of Teaching Science and Technology
Linux-SIS	Linux Schools Internet Server
Linux-TLE	Linux Thai Language Edition
MICT	Ministry for ICT
MOE	Ministry of Education
NECTEC	National Electronics and Computer Technology Center
TOT	Telephone Organization of Thailand (now TOT Corporation)

Glossary of Terms

ADSL	Asynchronous digital subscriber line, Fast, always-on broadband Internet connection.
AUP	Acceptable use policy.
Bluetooth	A short range wireless connectivity standard used by mobile and handheld devices such as cell phones, PDAs, headsets and notebook computers.
Broadband	Internet connection faster than 200 Kbps (kilobits per second).
ccTLD	Country-code top level domain. Internet country domain code, such as .th for Thailand.

CD(-ROM)	Compact disk (read only memory).
CD-R	Writeable CD format.
CMS	Content management system.
Digital divide	Divide between those who and do not have access to the Internet.
DNS	Domain name system, which translates Internet domain names to IP addresses.
DSL	Digital subscriber line. See ADSL.
DVD	Digital video disk. High-capacity storage medium for digital video and data.
DVD-R	Writeable DVD format.
E-rate	Education rate. Discounted rates for telecommunications and/or Internet services for educational institutions.
Fat client	Workstation where applications are stored and run locally rather than on a server.
Firewall	System which provides protection against unauthorised intrusion, worms and viruses by blocking certain types of network traffic.
Free software	Software provided with source code and a licence which permits users to modify and redistribute the software under the same licence.
HTML	Hypertext markup language.
IANA	Internet Assigned Numbers Authority.
ICANN	Internet Corporation for Assigned Names and Numbers.
IM	Instant messaging.
IMAP	Internet message access protocol.
Information literacy	The ability to locate, evaluate, analyse and synthesise information from a variety of sources.
IP	Internet protocol. The underlying protocol used by systems on the Internet.
ISDN	Integrated Services Digital Network: telecommunications service providing fast digital dial-up connections to the Internet (up to 128 Kbps).
ISP	Internet service provider.
Kbps	Kilobits-per-second.
LAN	Local area network, connecting computers within a building or campus.
LMS	Learning management system.
Metadata	Structured information that describes an item of content or software.
MP3	A popular format for digital sound files.
Open source software	Software provided with source code and a licence which permits users to modify and redistribute the software (similar to free software).
Operating system	Underlying software layer which allows application software to be run on a computer or other device.
PC	Personal computer.

PDA	Portable or personal digital assistant
PDF	Portable document format. A platform-independent format for distributing documents.
POP(3)	Post office protocol. Popular method of accessing Internet e-mail from a server.
Proprietary software	Software which restricts access to source code and does not allow users to freely copy or modify the software.
RAM	Random access memory.
Server	Computer which provides file, printing or other services to other computers on a network.
SMS	Short message service used for text messages on GSM mobile phones.
SMTP	Simple mail transfer protocol. Internet protocol for sending e-mail between systems.
TCO	Total cost of ownership. All costs associated with deploying, operating and maintaining a computer network and applications.
Thin client	Workstation model which allows users to run applications on a server, rather than on the workstation itself.
TV	Television.
Unicode	System for representing language characters in international character sets.
URL	Uniform resource locator. Internet address format used for Web sites and other information services (e.g., www.unesco.org).
VCD	Video compact disc. A CD which contains digital video material.
VCR	Video cassette recorder.
VPN	Virtual private network. Network which runs on top of an existing network, providing additional security, addressing or management features.
W3C	World Wide Web consortium, which defines the standards used on the World Wide Web.
WAN	Wide area network, connecting networks over a large geographical area.
WiFi	Wireless fidelity, generic term for wireless networks using the 802.11 protocols.
workstation	Computer used by users to run applications and access network services (see server).
WWW	World Wide Web.