Context

The socio-economic diversity among the countries of the Asia-Pacific region is extreme. The region includes countries such as Australia, Japan and the Republic of Korea, all with comparatively mature economies, competitive ICT infrastructure and solid human resource bases, as well as countries in Central and South-East Asia that are at hugely differing stages in their development, and are facing far more daunting challenges. These variances are reflected in the country reports on the status of ICT applications in education that collectively form the main body of this report. The purpose of this concluding chapter is to provide the reader with an overview of those differences, as well as a summation of the challenges and opportunities that confront educational policy makers, managers and teachers who are striving to use these technologies in ways that will add value to the current state of practice.

The picture that emerges from the reports is one of a continuing process of change. In the first instance, it is apparent that leaders in all countries recognize the growing impact of ICTs on their societies and economies. Most are aware of the need for a labour force that has the skills and knowledge to enable their country to function in a global “e-economy”. Differences become apparent when one examines the actions different countries have taken in terms of applying and integrating ICTs into their education systems to help achieve this target. For example, countries are at different stages of both development and implementation in the areas of policy formulation, ICT infrastructure development and access to it, content development, programme initiatives and the training provided for education personnel. While many factors account for these differences, few will be surprised to learn that, primarily, they are related to the available fiscal and human resources. However, they also result from differences in the perception of the role of ICTs in the teaching-learning process. On one hand, it is obvious that if a country is to have a technically skilled workforce, it is essential that students in schools and post-secondary institutions are taught to use ICTs as part of their course of study. On the other hand, however, the role of ICTs in enhancing pedagogy in all parts of the curriculum is less obvious, and therefore
Policy frameworks

Policies are an important ingredient of any leadership and management process. If properly developed, a policy framework provides a vision of desired end outcomes, it defines the results that need to be achieved in order to reach those ends, and it provides guidelines for how the results are to be achieved. As such, a policy framework has multiple levels, ranging from general “vision” statements defining outcomes, to specific results, with timelines and measurable outputs. In practice, the process of policy development is usually iterative and often described in cycles. For example, a policy may be developed and promulgated only to find that there are constraints which make it difficult to implement, making it necessary to revise the policy, or to add another phase. This can be seen in the case of the Republic of Korea. This country is in its second policy plan stage, which includes standardising ICT skills, revising curricula, closer monitoring and other dimensions. Yet the country report shows that not enough software is available to meet the excellent hardware provision in schools, and that there is a lack of standardisation of existing materials. Other countries can learn from this and might be able to leapfrog this stage by planning and earmarking early funds for a standardised content development. This lesson will also apply to experiences at much lower scale, for less privileged countries which are exploring the integration of ICTs into teaching and learning.

Suffice it to say that there is no “best” way to go about the process of policy development – a point that is underscored by the variety of approaches that have been described in the foregoing country reports.

The following observations, distilled from the reports, provide an overview of the differences among the countries of the Asia-Pacific region in terms of their progress to date regarding development of policies to guide implementation of ICTs into their education systems:

- All countries have given some thought to the present and future impact of ICTs on their economies and cultures and accordingly have promulgated, as a minimum, some statement of vision regarding development goals. These might remain general, IT centred and not specifically relating to the education system.

- There are remarkable differences among countries in their “visions” for the role of ICTs in economic development. For example, Sri Lanka has developed a comprehensive strategy to position the country as a “hub” for ICT development in the sub-Asian region, including for open source software; the Democratic Republic of Korea has committed to the development of excellence in science and technology and is focusing on the training of gifted students in order to develop the necessary expertise; and others, such as Mongolia, have a vision for a “knowledge-based” society in which people have access to ICT infrastructure, and the skills to use it, to enhance all aspects of their lives.

- Countries are at differing stages in terms of having a policy framework that goes beyond the “vision” level. Some, like Nepal, have a national vision but no detailed policies. Malaysia and the Philippines, on the other hand, have developed comprehensive policy frameworks for the application of ICT in education that are nested within an overall national ICT development policy.

- Those countries that have the most mature policy development processes in place are, not surprisingly, those with more mature and robust economies such as Australia, the Republic of Korea and Japan. These countries not only have comprehensive policy frameworks, but also implementation strategies and mechanisms, measurement indicators, and have committed resources to such matters as infrastructure access and connectivity, training and learning software development.

- Countries also differ in the processes used for developing policy. For example, several of the Pacific island countries are participants in a regional ICT policy development initiative called the Pacific Islands Policy and Strategic Plan. Others are developing policy with assistance from various agencies such as UNESCO and UNDP. Others, such as India, have quite adequate internal resources to manage the task.

- The forces that influence policy also differ among countries. For example, the ICT policy in the Democratic People’s Republic of Korea was decreed by the national leader. In contrast, the process in the Republic of Korea is iterative in that it is informed along the way with information from formative evaluation and research, with adjustments made in the policy as necessary.

- One of the most striking differences among the policies of countries relates to differing perceptions regarding the role of ICT in education. These fall into three categories – one is that ICT must be taught in upper-secondary institutions as a subject, in order for the country to have a labour force with essential skills; another is that ICT must be part of specific areas of the curriculum to improve subject teaching, e.g. to simulate experiments in physics; the third category aims at creating knowledge societies with
ICT-savvy citizens and skilled workers, in which, potentially, anyone can learn anytime, anywhere.

As is being realized in most of the countries, writing policy is the easy task! Implementing it is what is difficult and costly. As Green describes in the paper on gender issues, policy needs to be developed in tandem at multiple levels. For example, policies regarding access to infrastructure, connectivity, content development, training, etc. need to be developed and implemented concurrently for initiatives to be successful. Furthermore, it is not sufficient for policies to exist only at the national level. They need to be articulated with those at state/province and school levels to ensure that ICT adoption is encouraged and supported.

In summary, the countries are arrayed along a continuum of stages with regard to policies pertaining to the integration of ICT into their education systems. While all of them have stated that the development of ICT capacity is important to the future of their countries, fewer have grappled with the policy questions as they relate to ICT applications in education – and many of those that have lack the resources to implement their strategies, a recurrent theme throughout the reports. This “lack of resources” reflects, however, weaknesses of existing policies and the need to improve them.

The first and most overlooked aspect in many policies is the question of scope: realistically, what can and what cannot be achieved? Secondly, there is little alignment with educational goals; ICTs remain an add on. Thirdly, there seems to be little planning for educational change. Successfully integrating ICTs into education systems means often radical shifts in teaching and learning, shifts that are little acknowledged or planned for. Lastly, we learnt that policies were developed by outside consultants or individuals/units in the Ministry of Education, often without stakeholder participation. Nevertheless, broad consultation and ownership are crucial to sustaining momentum during the often difficult implementation stage.

**From vision to reality – the state of access**

As mentioned previously, there is a great deal of variance among the countries regarding ICT applications in education. In some countries, such as Australia, New Zealand, the Republic of Korea and Japan, the available resources have enabled a degree of ICT integration in education that is exemplary in world terms. Others, of which Malaysia, the Philippines and China are examples, have comprehensive policy frameworks in place and are devoting considerable resources to implement their plans by increasing the availability of ICTs, including computers, connectivity and training at the institutional level. Mongolia, Viet Nam, and many of the Pacific Island Countries are examples of countries that have articulated policies for the use of ICT in education, but where implementation is occurring primarily through projects that are donor-sponsored. In addition, there is a sizable group of countries still at the stage of dealing with ICT development at a macro level and have not yet defined application goals for the education sector. Yet even here there are typically some donor-sponsored projects that are attempting to provide demonstrable evidence of how ICTs can be applied to benefit education in that country.

The following points illustrate the various ICTs being used, the level of access to them among different user groups, and the factors that appear to be influencing levels of access:

**In general terms, the adoption of ICTs in education is following the chronology of their development. In other words, the use of broadcast technologies, such as radio and television has been followed by the introduction and use of computers as stand-alone appliances, followed by networks that enable e-mail and file sharing, which then leads to Internet connectivity. Now we have the emergence of wireless networks and the advent of mobile or “m-learning”.** The examples of ICT use described in the country reports reflect this evolutionary pattern, with the rate of adoption in a country being primarily influenced by the level of ICT infrastructure development in that particular country. The education sector generally follows the private and communication sector in their degrees of ICT integration; it seems that anything else would not be sustainable.

**There is a degree of “appropriateness” in the pattern of ICT usage in the Asia-Pacific region that stands in contrast to that seen in North America and western Europe where the tendency to adopt the “latest and greatest” of the newer ICTs has been rampant, with the old being discarded in favour of the new. In contrast, radio and TV are widely used in countries such as Mongolia, Nepal, Pakistan, China, and parts of Central Asia, to reach large numbers of people with non-formal education programmes. Even in countries like Japan and the Republic of Korea, with world class ICT infrastructure, both radio and TV are used extensively. The lesson here is not to “throw the baby out with the bathwater” when it comes to making decisions about appropriate use of ICTs in education.**

**We also see a creative “mixing and matching” of the old and new technologies in countries such as Nepal, the Philippines, Sri Lanka and Bhutan where radio is being combined with information retrieval using the Internet. This is referred to as “radio browsing” and is being used to provide both non-formal education, as well as support for classroom teachers.**
Examples of dedicated networks strictly for educational purposes are also emerging. The paper on India describes the imminent launch of a satellite that will enable the provision of several television channels and dozens of radio channels for educational use. Many of the Pacific Island Countries are members of the University of the South Pacific consortium that uses a satellite-based communication network (USPNet) to deliver university courses and some non-formal education, using teleconferencing, e-mail and the web. Indeed, USPNet provides a good example of successful regional cooperation.

Wireless networks are starting to appear. Bangladesh is arguably one of the world’s more active examples in using wireless technology to support the many facets of development education. The Philippines is the site of an innovative mobile m-learning project that incorporates wireless technology.

There are also examples of web portals, such as those in Mongolia and the Maldives that have been developed as a means of sharing teaching resources.

But in spite of these burgeoning, and often innovative, developments, access to ICT appliances such as computers, communication networks, and Internet connectivity remains low or nonexistent for the vast majority of educators in all but the most developed of the Asia-Pacific countries. Even when access is available, the staff of educational institutions typically lack the skills, knowledge and comfort level to make use of them. A Pacific Island Country report shows that the little existing infrastructure is actually being underutilized. Research has shown in other cases that access could be tripled, just by using existing resources to their full capacity.

The issues of the “digital divide” are more complex than a simple comparison between the so-called “developed” and “developing” countries. There are many intra-country factors creating barriers. In many countries, with the exception of Japan and the Republic of Korea, access to ICTs by girls and women is a major concern. While there are programmes in some countries that are vigorously addressing the issue of lower ICT-related participation by girls and women, equity issues remain an important concern. Intra-country digital divides are also rooted in socio-economic issues such as: differences between rural and urban areas, differences within urban areas and age groups, language barriers, caste differences, lack of access to electricity and lack of access to ICT infrastructure.

The authors’ analyses of country realities are sometimes measured with an implicit hierarchy of the best set-up: from a fully Internet-connected classroom, down to the radio use in community learning centres. Despite this fact, the main question remains, which is the most (cost-) effective solution for the educational purpose, and which is not: how can we get our school online and what will it cost? In many countries, one can find a strong focus on technologies and on connectivity, e.g. giving benchmarks on what the pupil - (connected) computer ratio should be by 2005, etc. The Republic of Korea requests their teachers to use ICTs for teaching and learning for 10% of total classroom time. Yet specifying the degree of curriculum integration, as well as making explicit indications and training on how exactly the computers and online information/communication possibilities should be integrated effectively remains the exception. In addition, many claimed “online experiences” in learning environments can be had with only a minimal (or no) connection to the Internet, with the same learning outcomes. Some learners are therefore much better served by a systematically integrated Interactive Radio Instruction programme, than by a rarely or badly used Internet-connected computer set-up.

**Current initiatives**

There appears to be a common pattern of development among the countries regarding the adoption of ICT applications. It is sequential and somewhat linear, necessitating that each phase be completed to some minimal level before the next can be undertaken successfully.

The first phase of this adoption process typically involves ICT applications in the area of administrative functions such as finance, student records, and personnel. While these types of applications are not the focus of this report, it is interesting to speculate about the necessity of accomplishing this phase in order to get administrators “on side”, and to have the support systems in place when applications that are more directly related to the teaching/learning process come to fruition.

The next adoption phase involves teaching about ICT. Here we see a wide variety of initiatives that range from setting up computer labs to developing ICT curricula. In turn, these curricula include subjects ranging from how to operate a computer, to how to use software, to learning programming languages. Indeed, if one examines the content of the policy statements extant in many of the countries, it is clear that the development of ICT skills and competencies in the labour force is the top priority for many governments.

The “teaching about ICTs” phase has two effects that provide the platform for the next phase: the use of ICTs by teachers to develop and acquire materials
that support their teaching in other subjects. The first of these effects is that the school or institution becomes equipped with some ICT appliances and networks along with some level of Internet connectivity. The second is that one or more teachers with ICT skills become available to colleagues for support and collaboration. Thus teachers can begin to visualize how they can use the technology to support their teaching, and they have access to the means to do it. While it is often the case that this phase begins through the innovative efforts of a few teachers, it must, in the end, be championed and supported by governments and donor agencies. The reports are rife with examples of this. The “Smart Schools” programme in Malaysia, the emergence of portals for sharing materials among teachers as in Mongolia, and the growing emphasis on teacher training are examples of wider initiatives to help educators use ICTs as part of the pedagogy in all parts of the curriculum. Countries such as the Republic of Korea, Australia, Japan and New Zealand are much further along in their development of this phase.

The next phase is more opaque because there are very few examples mentioned in the reports. Nevertheless, the initiatives that are underway are transforming the traditional role of “teachers” who are becoming facilitators of learning. As ICTs are employed to enable learners to access information on their own, the teacher’s role shifts from being primarily an information provider to that of helping learners manage and interpret information. Many authors of country reports have identified this type of teacher training as being of crucial importance in the continuing evolution of ICT applications in formal education. Little space was left in the reports to analyse the important “teaching culture” changes this implies and the challenges this represents, even for technologically advanced countries. The imminent changes of teacher roles re-emphasise the need for the participation of all stakeholders, including teachers, in the planning and policy process, to find feasible solutions and applications.

The area of non-formal education presents a totally different picture. First of all, the target learners in non-formal education are different from those in the formal system. They are often out-of-school youth and adults whose learning needs are the development of functional skills in basic literacy, health education, food production or human rights, and they live in communities where applications of the digital ICTs are difficult to implement in a sustainable way. Meeting these needs requires technologies that can reach mass audiences, while not increasing existing disparities by ever-increasing the “digital divide”. Here too, there is a pattern of ICT applications that emerges from the country reports:

- The country reports on Nepal, Pakistan, India and Afghanistan document a wide variety of radio programme initiatives covering topics such as health, food production, literacy, and human rights. A particularly interesting and seemingly effective example, begun by the BBC some years ago in Afghanistan, continues today. It is called “New Home, New Life” and uses a “soap opera” format to deal with such topics as repatriation, reintegration of returnees to the country, awareness of land mines, health, hygiene and sanitation, and conflict resolution.

- Television also plays an important role in many countries. Pakistan uses television extensively in non-formal education, as does Mongolia.

- While the traditional broadcast technologies will certainly continue to be used on their own as the main means to reach large numbers of learners, such technologies present a one-way form of communication, lacking the interactive capacity that enriches any learning experience. This, however, is changing with the trend to use the broadcast technologies in conjunction with telephone, e-mail, the web and the Internet. For example, in Bhutan, Nepal, and Sri Lanka listeners can use whatever means are available to inform the broadcaster of information they are interested in, and the broadcaster then “surfs the web” and broadcasts the information over the radio. This is referred to as “radio browsing”.

- Certainly the most ubiquitous innovation regarding the use of ICTs in non-formal education has been the development of telecentres at the community level where people can access ICT appliances as well as learning opportunities – both formal and non-formal. While this is well documented in many of the papers, two are particularly noteworthy. Viet Nam has established a network of such centres with support from the Coca-Cola Company – a somehow astonishing example of what can be accomplished through partnerships, which would be interesting to study in more depth at a future date. Meanwhile, the Swaminathan Foundation has established partnerships with dozens of villages in the south of India to empower people to manage ICTs for their own purposes. That may vary from obtaining market information, health education, marketing locally produced products, or literacy training.

Many of the initiatives described in the reports involve development of new organisational arrangements that are designed to foster and support the use of ICTs in education.

- One example is the growing number of SchoolNets throughout the region that are providing support for teachers, facilitating the development and sharing of
learning materials, and helping to create and sustain e-mail and Internet access for schools.

Another is the emergence of research and development bodies with mandates to undertake formative evaluation projects, establish benchmarks and standards, and monitor policy achievements. Examples of such bodies are described in the papers on Australia and Republic of Korea.

Much more recent is the work of organisations such as EdNA in Australia that works across all education sectors to support the use of ICTs. As a result, Australia is at the vanguard of countries working on the development of online learning object repositories.

While there are a great many initiatives underway in the countries of the Asia-Pacific region, the majority of them in developing countries are made possible by support from donor agencies. This raises the question about their sustainability when the donor-funded stage is completed. Much more troubling, however, is the apparent lack of attention paid to assessing and sharing results from these projects. There are some cases of evaluation assessments currently being undertaken. In Sri Lanka, for example, research is underway on how urban poor access ICTs, while in the Solomon Islands, factors that affect the use of facilities by rural populations are being explored. However, the country papers are notably silent about initiatives of this sort, not because the authors have ignored the question, but because examples of the kind mentioned above are so rare. This may, of course, be due to the fact that so many of the initiatives are new, but it does underscore the importance of initiatives such as the portal on the use of ICT in education that has been created by UNESCO. This is one of the few “one stop shopping centres” for information about the use of ICTs in education (www.unesco.org/bangkok/education/ict/).

Constraints and challenges

The factors that constrain the adoption of ICTs in education can be grouped as follows:

National Priorities

Many countries in the Asia-Pacific region, among them those in Central Asia, the Pacific Islands, Myanmar, Cambodia, and Lao PDR, face difficult choices when it comes to making policy decisions regarding the increased use of ICTs in their education systems. On one hand, there is the reality that there are too few teachers with even basic teaching qualifications, too few schools for the numbers of students, and insufficient teaching materials to support the most conventional of learning environments. It seems that in many countries, ICTs have not been explored enough to face the severe Education for All (EFA) challenges. ICTs are often immediately linked to expensive high-tech solutions and low-tech but effective open and distance learning options, opportunities for effective multi-class teaching; to include those with special needs etc. remains unexplored. On the other hand, governments are acutely aware of the importance that the new ICTs play in the global economy and are therefore driven to acknowledge this importance in some way too. Thus, we have the situation described in so many of the country reports, where a national vision, sometimes along with a detailed policy framework, promulgates the importance of, but does not implement the use of, computers in schools, except in the context of donor-sponsored demonstration projects.

ICT Infrastructure

Obviously there must be access opportunities if educators are to make use of ICTs. This is highly variable among countries in terms of such issues as access to ICT appliances, Internet connectivity, connectivity speed, reliability of electricity, and cost of service. These are the ingredients of the “digital divide” that is manifest most profoundly between countries such as the Republic of Korea, Japan and Australia on one hand, and those that are less affluent on the other. However, the gaps in access to ICTs are also intra-national. They exist between rural and urban areas, between the wealthy and poor areas, and among social strata based on gender and, sometimes, on caste.

Policy Goals

As noted earlier, policy statements regarding the role of ICTs in education vary widely in terms of goals that have been set. For instance, the policy goals of the Democratic People’s Republic of Korea have resulted in a focus on training gifted students in specialised institutions. In contrast, the policies and practices in the Republic of Korea encourage all citizens to become ICT literate, with the result that there is ready access to ICT infrastructure as well as opportunities to learn about applications. Between these polar examples are national policies that define ICTs as an essential subject in the curriculum, in contrast to others that call for the integration of ICTs into pedagogical practice across the curriculum – a difference that clearly influences both the numbers of teachers being trained, as well as the content of the training itself.

The reports identify a number of language-related problems, which stem in part from a lack of appropriate policies or strategies. Difficulties displaying local-language scripts on a screen persist, for example in Afghanistan, Cambodia and Laos. There is also a lack of quality, local-language content in many countries, both in terms of software/learning materials, as well as training manuals. This is, in part, a knock-on effect of the script issue, but it also extends to many other countries in the region: Bhutan, India, Indonesia,
Laos, Maldives, Mongolia, Thailand and Viet Nam, to name but a few.

**Teaching Practice**

The reports showed the multiple dimensions necessary for a successful ICT integration in the classroom, to which teachers remain the key. Teachers are more likely to incorporate ICTs into their teaching if they feel confident in using the technology, and if they perceive that doing so will be of some benefit as opposed to just adding more work to an already busy schedule. They need a supportive environment and general guidance, individual incentives, clear policies, curricula, instruction and training, and they benefit from peer support and interaction in networks. The lack of ICT-based instructional materials, and more specifically, the lack of such materials in the local languages is one reason mentioned why teachers are sceptical about the value of ICTs in their classrooms. Even those that do have access to the Internet are constrained in terms of making use of it because so much of the content is in English. Some country reports mention, however, that more than half of the teaching workforce has never benefited from any pre- or in-service training. Some examples show how ICTs can well be used to do both, familiarize teachers with ICTs and to offer training in content, pedagogy and a broad range of skills.

**Money and People**

The lack of funding and the dearth of trained staff are the two most cited constraints to ICT application in education. The lack of funding for the development of infrastructure and the purchasing of hardware and software are the most obvious. Public-private partnerships (PPPs) could be promoted to address this problem, but remain an under-explored option in the region. While several examples of PPPs are mentioned in the country reports, few are at scale, and many remain at the pilot project stage. Some reports, specifically those on Cambodia, Laos and Myanmar, mention the need to create a more amenable climate for promoting and attracting greater private-sector involvement in all areas of ICT development, from upgrading infrastructure, to NFE and TVE, to establishing more training institutes and Internet cafes.

However, the lack of human expertise is equally constraining in that it impacts on everything from policy development, to infrastructure servicing, to the provision of training for teachers and the development of instructional products.

The constraints and challenges teachers and pupils face of course differ from the above described development stages. Yet one report shows that even a perfect infrastructure and ICT literate teachers and students do not guarantee that these technologies are really being used to help pupils to think, to analyse critically, to learn how to solve problems, to interact and communicate, evaluate information resources, synthesize etc. New challenges have arisen, such as the “Internet addiction” of pupils who spend their lives playing games, visiting porn-sites, chatting, breaking copyright laws etc. The country reports also rarely mention the ongoing challenge of working in line with EFA goals towards gender equality, and of using ICTs systematically for this purpose. Few projects promote the active enrolment of girls in ICT programmes, provide incentives in the form of, say, scholarships, or include awareness-raising activities. One example of an NGO actively involved in promoting ICT education to girls, however, can be found in Pakistan. Since November 2000, the Ma’arif Education Society (MES) has been aiming to promote access to, and quality of, ICT education for women. MES also works to increase female participation in ICT education, in particular through the Ma’arif Institute of Information Technology, as well as by educating young girls, especially, about the appropriateness of women working in ICT-related fields.  

Again countries exploring a higher degree of ICT integration can learn from these experiences, addressing early ethical questions in an effective way, also stressing the need for other social interaction in real life.

Most importantly these experiences show that even fully equipped classrooms and technically skilled teachers are not a solution in themselves. The main questions on learning remain: what should the pupils know, be, be able to do - and how exactly can technologies assist in this individual and social development?

**Strategies and opportunities**

The country reports describe a wide variety of strategies that are being employed to introduce ICT applications into educational systems. The authors also offer their own analysis of the lessons learned and new approaches that might be tried. The following summary provides an overview of the points made:

- **All authors identified training as a critical determinant of successful ICT applications.** While training for teachers is an obvious need, many authors also stressed the importance of training for administrators and support staff.

- **The content of training programmes needs to cover much more than simply how to operate a computer.** Teachers also need to learn how to incorporate ICTs into the teaching of all subjects in curriculum, and to develop appropriate instructional materials.

- **Some innovative models for providing training and support for teachers have been developed.** For example, New Zealand has introduced the idea of “cluster schools” with a “lead” school in each cluster
that has the resources to provide training for staff at other schools in the cluster. Thailand uses the strategy of “peer-to-peer” training, and others are accessing online courses. Strategies such as these are more conducive to the provision of training on a “just-in-time” basis, and are therefore more likely to help teachers feel supported in their efforts to change how they practise as teachers.

Palau, a country that is well above the norm in terms of ICT integration in education, has initiated the “Teaching, Learning, Technology Training Project”. This uses a professional development framework based on a number of critical ICT competencies such as being able to operate ICT appliances, use software applications and develop academic skills. These are then aligned within five developmental stages ranging from entry-level teaching skills to ones at more advanced levels.

The reports describe a variety of strategies for introducing ICTs into education systems, ranging from ones that are initiated from the top down to those that begin at the grassroots level. While there is no “right way” to do this, one of the lessons learned is the importance of multi-level policies and supports – from national to school levels – if the innovation is to succeed.

The important role that partnerships can play in facilitating the use of ICTs in education is clearly evident in many of the reports. Partnerships that might include non-government organisations, government, private sector companies, donor agencies and/or international institutions can help schools solve infrastructure access problems, train staff, produce materials, and pilot test innovations. The “adopt-a-school” project in the Philippines, the learning centre development programme in Viet Nam, the BBC-produced radio soap operas broadcast in Afghanistan, and the US-China collaboration to teach English online, are but a few of the examples described in the country reports.

Within countries, more collaboration among schools is needed in terms of resource sharing. Training, materials development and infrastructure maintenance are costly and therefore difficult for educational institutions to afford. Finding models through which to share investments, risk and expertise is therefore of critical importance.

While the rapidly emerging use of wireless networks and mobile learning in countries like Bangladesh and the Philippines may create the impression that the broadcast technologies are giving way to the Internet, the evidence is contrary. Indeed, the use of radio and television remains important, and in the case of radio, it is used in ways that expand access to the Internet.

In summary, the vast majority of countries in the Asia Pacific region are still at an early stage in the process of adopting ICTs into their education systems. For most students and teachers, using a computer to send an e-mail or surf the web is still in the future. However, this situation is changing rapidly, and as it does, policy makers and education leaders need assistance as they make investment decisions. They need to know more about what is being learned from the many projects currently underway in the region and around the world. They need valid indicators by which to measure progress and better models for evaluating ICT options that are available in order to maximise the benefits for their country. Unfortunately, the state of development of these decision tools is still quite primitive. In 2003 UNESCO launched, however, twelve ICT in education projects financed by Japanese Funds-in-Trust, to assist Member States in Asia and the Pacific in meeting key challenges described and analysed in this survey.

NOTES
1 The authors used the UNESCO terminology of Results-Based Programming, Management and Monitoring (RBM), as defined by UNESCO’s Bureau of Strategic Planning in the RBM guide 2001.
3 Local web servers, CD-ROMs, proxy caching servers, e-mail server on the local network can also save often downplayed operating costs. For more information see http://www.unescobkk.org/education/ict/technologies or read the Planning for Technologies section in the TechKnowLogia Jan-March 2002 publication at www.techknowlogia.org.
4 See for example the Japan country report.
5 Please visit www.unescobkk.org/education/ict for more information.
6 ‘www.123freehost.co.uk/sites/maarif/; Also, see: ICT Education for Women in Pakistan: A Political or Economic Issue?, Ahsiya Posner, research paper: www.gse.harvard.edu/~views/VIEWS_posner.pdf