Asia Pacific Ministerial Forum on ICT in Education 2012

Outcome Document

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Executive Summary

The Asia-Pacific Ministerial Forum on ICT in Education (AMFIE) was designed as an annual platform for policy-level knowledge exchange and dialogue, showcasing a number of promising models and experiences in developing, adapting and/or monitoring ICT in Education policies and practices in countries at different development levels. Participating high-level officials were invited to present specific needs and challenges that their countries face, opening up inter-directional dialogues to initiate or strengthen partnerships between emerging and high-performing countries.


Official delegates came from the following Member States: Bangladesh, Bhutan, Brunei, Cambodia, People’s Republic of China, Laos People’s Democratic Republic, Indonesia, India, Japan, Maldives, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Singapore, Republic of Korea and Thailand.

A summary of the discussion during the AMFIE 2012 is as follows:

ICT-in-Education as a means to reduce societal inequities

By focusing ICT-in-education policies on underserved populations, governments can begin to bridge the ‘digital divide’ that restricts the opportunities for underprivileged and rural students. However, the provision of technology alone will not facilitate the deep structural changes necessary to achieve the EFA goals.

Translating ICT-in-Education Policies into Action

The spread of ICTs and the expansion of educational opportunities have similar power to transform societies. Uniting these forces in a coherent plan can place a nation on the path to ‘knowledge creation’ and introduce the possibility for perpetual innovation to solve pressing global problems. Extending the discussion of ICT-in-Education to a broad-ranging societal transformation is key to involving actors beyond the Ministry of Education, and thus ensure greater success of initiatives.

Training, Supporting, and Evaluating Teachers for ICT-in-Education

The central place of teachers in the education process is accepted globally. Therefore, a consistent theme of AMFIE 2012 was the need for specific policies and projects targeting teacher competencies in the digital age. Teachers need to be both digital workers and digital learners, utilizing the full range of tools at their disposal in the internet age.

Recommendations for Policy

• Engage in holistic, multi-sector and multi-year planning
  Bring together actors from across government sectors to formulate a long-term vision, robust enough to withstand administrative turnover.

• Enhance public-private partnerships for strategic policy implementation
  Draw on the full expertise of the international community, including development agencies, multinational companies, and non-governmental organizations.

• Adapt competency frameworks and prioritize data collection
  ICT competency standards should be set for both students and teachers. These standards must be measured on a regular basis, with the results shared internationally and used to inform policy adjustments.
• Consider the societal costs of the long term use of technology and cyber wellness of users
  Educating children (and adults) on how to navigate the increasingly perilous internet landscape must be included in any long-term policy considerations.

Recommendations for Practice

• Focus on ICT as a lever to achieve for quality education for all
  The most successful ICT-in-Education programs focus improving education, not on delivering technology

• Build skills within teaching body as a route towards a shared vision
  Providing teachers with the skills to utilize ICT-enabled lessons allows the vision of ICT-in-education to be shared at the front lines of an education system.

• Utilize demonstration schools as a means of testing and spreading innovations
  It is crucial to build ‘safe places’ within an education system, where teachers can be free to test out new technology and rigorous evaluations can be conducted before mass distribution.

Recommendations for Information Sharing

• Use pilots and evaluations to prove worth and build consensus
  Sharing the results of ICT-enabled innovation into the public sphere allows a wide range of actors to participate in improving education.

• Share data, policies, and programs
  Providing historical and current information to the UNESCO Institute of Statistics (UIS) and World Bank databases increases their value for researchers, policymakers, and educators alike.

• Think beyond your borders
  The potential to resolve both access and quality issues will only increase as policymakers and practitioners consider a borderless education system.
AMFIE 2012 Background

The UNESCO Asia-Pacific Regional Bureau for Education (UNESCO Bangkok) and the Intel Corporation (Intel) co-organized the first Asia-Pacific Ministerial Forum on ICT in Education (AMFIE) in 2010.

The AMFIE was designed as an annual platform for policy-level knowledge exchange and dialogue, showcasing a number of promising models and experiences in developing, adapting and/or monitoring ICT in Education policies and practices in countries at different development levels. Participating high-level officials were invited to present specific needs and challenges that their countries face, opening up inter-directional dialogues to initiate or strengthen partnerships between emerging and high-performing countries.


Official delegates came from the following Member States:

- Bangladesh
- Bhutan
- Brunei
- Cambodia
- People’s Republic of China
- Lao People’s Democratic Republic
- Indonesia
- India
- Japan
- Maldives
- Malaysia
- Mongolia
- Myanmar
- Nepal
- Pakistan
- Philippines
- Sri Lanka
- Singapore
- Republic of Korea
- Thailand

Results from Surveys and Evaluations

AMFIE 2012 attendees responded to surveys immediately prior to and at the conclusion of the forum. Given the heterogeneity of the Asia-Pacific region, a wide range of results were reported. Responses were coded and analyzed, with the results detailed below.
Pre-Forum Survey

The pre-forum survey was designed to identify the most pressing issues for forum participants and the support needed to resolve them, in order to craft more effective forum sessions. Data were collected between August 6th and September 5th, 2012. Respondents were delegates and national ICT experts.

The results are as follows:

Key challenges identified included:

ICT Policy Development

- Need for research-based policy guidance on ‘what works’
- Tight fiscal constraints hinder ICT Master Plan priorities
- Monitoring and evaluation on impacts of the ICT policy

Partnership and Investments for Infrastructure

- Finding stable funding resources to develop the sustainable ICT use in schools
- Infrastructure gaps between urban/rural areas

Teacher Development

- Clear policy guidance on teacher competency
- Teachers capacity building for pedagogical use of ICT
- Government-provided educational information system that can help teachers lessen the administrative burden
School Reform

- Difficulty scaling up innovative practices from single schools to system-wide use

Key support mechanisms identified included:

Human Resources and Teacher Training
- Methods to develop teacher to be able to cope with new technologies effectively
- Teacher professional development in collaboration with higher education providers
- Comprehensive teacher education programme to prepare teachers to be in touch with the realities of actual situations in schools now and the future

PPP and Infrastructure
- Suggestions for strategic direction on infrastructure to cover rural, urban, and mobile generations
- Assistance to build partnerships with for-profit and non-profit entities

Financial Support
- Stable sources of funding or revenue
- Long term financial support

Research and Technical Assistance
- Building and standardization of data collection procedures
- Optimizing the use of ICT resources
- Assessing the impact of technology use on learning and the acquisition of 21st century competencies

Information Sharing and Collaboration
- Sharing of information, experiences, good/best practice and lessons learned on creating good policy or strategy for ICT in education among countries that already have high experience
- Successful practices in other governments…to assess relevance and appropriateness to our local context

Post-Forum Survey

The post-forum survey assessed the relevance of individual AMFIE sessions and determined the likely impacts of the AMFIE on policy and practice within each country. The surveys were distributed immediately
following the last session, with 41 respondents submitting answers. The results are as follows:

<table>
<thead>
<tr>
<th>Please indicate the impact/relevance of each session to your delegation’s mandate (with 5 as the highest)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1: The Power of ICT Policies</td>
<td>3.82</td>
</tr>
<tr>
<td>Session 2: ICT Policies &amp; Smart Partnerships and Investment for Infrastructure</td>
<td>3.85</td>
</tr>
<tr>
<td>Session 3: ICT Policies &amp; Teacher’s Competencies</td>
<td>4.07</td>
</tr>
<tr>
<td>Session 4: ICT Policies &amp; School Innovation and Emerging Technologies</td>
<td>3.93</td>
</tr>
<tr>
<td>Workshop 1: International Support for Transformation Education Policy</td>
<td>3.58</td>
</tr>
<tr>
<td>Workshop 2: Importance of Data-informed Policy and Open EMIS</td>
<td>3.32</td>
</tr>
<tr>
<td>Ministerial Dialogue: Way Forward</td>
<td>3.9</td>
</tr>
</tbody>
</table>

The respondents identified a wide variety of AMFIE initiatives with potential for replication in their countries.

According to the survey responses, low to middle-income economies (as categorized by the World Bank) sought general advice on developing ICT policy and improving teacher competency. These results demonstrate that the necessity of establishing basic conditions before moving to explorations of more advanced ICT usage in education. In contrast, high-income economies reported a desire to imitate specific models and practices from other states. With ICT policy already established, smaller ‘projects’ can be considered for their applicability to the overall vision.
Major Themes Across Sessions and Discussions

Theme One: ICT-in-Education as a means to reduce societal inequities

In her opening address for AMFIE 2012, Irina Bokova, Director-General of UNESCO, noted that ICT-in-Education must be discussed against the backdrop of the Education-for-All (EFA) movement and Millennium Development Goals related to education. As concretized in the 2000 Dakar Framework for Action, the six goals of EFA (see box) have a distinct focus on the reduction of inequity in education. Ms. Bokova went on to highlight the potential for ICT to serve as platforms to improve accessibility and quality, particularly among disadvantaged populations.

This potential was emphasized in several of the initiatives presented during AMFIE 2012, starting with Thailand’s One-Tablet-Per-Child (OTPC) program. In 2012, the OTPC will allot tablet computers to 865,092 Grade 1 students in 77 provinces. Purchased by the Thai government from a Chinese manufacturer, these tablets represent a substantial investment in ICT-in-education, with a clear goal of reducing digital divides in the highly unequal Thai society. The Thai tablets come preloaded with content for the core subjects, namely Science, Math, Thai, English, Buddhism, History and Civics. Teachers have been trained and supplied with two hundred days of lesson plans for integrating the tablets into the classroom. In 2013, the Thai plans to provide tablets to Grade 7 students in 77 provinces.

The options of extensive piloting before the rollout should be urgently investigated in order to avoid major revisions to the programme, including the grade level of users and educational contents. As UNESCO Bangkok Director Mr. Gwang-Jo Kim noted during the AMFIE press conference, “it is very critical to have policy quality…[and careful] monitoring and evaluating [of] the outcome of the initiative”.

A more straightforward initiative conducted by Thailand is the construction of a nationwide free wireless internet system. Free WiFi has already been installed throughout big cities using ADSL access points. Satellite signals and servers are being established to set up 40,000 internet access points across the country. Together with the OTPC program, this initiative provides a basis for further innovation in Thailand’s education sector.

A contrast in approach was provided with the FATIH Project in Turkey, which provided tablets to 5th and 9th graders in 2012, with plans to move to 6th-8th grades before finally supplying them to 1st-4th grades. Notably, the demand for technology provided sufficient funding for a Turkish company to create its own interactive whiteboard with an internet connection. This illustrates the potential for ICT-in-Education plans to spur the development of domestic industry.

Representatives from other nations also provided details about ICT programs targeting reductions in societal inequality. Argentina’s representative described Programa Conectar Igualdad (Connect Equality), a comprehensive national education strategy to enhance digital inclusion and the quality of education improvement processes. Sameer Sharma, Senior Advisor at the International Telecommunications Union (ITU) presented the ITU’s system “Connect a School, Connect a Community”. This system utilizes five modules with alternative ways to provide ICTs for indigenous people, women, and people with disabilities.

The use of ICTs for students with disabilities was also described by the Director of the New South Wales Curriculum and Learning Innovation Center in Australia. The Director noted that many ICT policies are “system led push” models, in which teachers are ‘pushed’ to gain competencies. He introduced the concept of “student-pull models” which are complementary to (not conflicting with) the system push models. An illustrative example was given of an Australian student with speech and reading disabilities. The needs of this student created a “pull” to set up a networked computer lab. Charlie was able to utilize technology
to connect up to three times a week with a speech pathologist over 600 kilometers away. As Mr. Varanasi noted, “ICT is the enabler, Learning needs are the change driver”

**Looking forward**

Given the deficiencies of transportation infrastructure and human capital in many developing nations, ICT provides an important mechanism for transmitting educational content and connecting expert teachers with students. Moreover, by focusing ICT-in-education policies and funding on underserved populations, governments can begin to bridge the ‘digital divide’ that restricts the opportunities for underprivileged and rural students. Although difficult to properly assess, ‘technological literacy’ is becoming as critical a basic skill as traditional literacy and numeracy. Support must be given to develop the capacity of students, not only to use the technologies of the present, but to learn to use, and eventually to create, the technologies of the future.

However, it is critical to note that the provision of technology alone will not facilitate the deep structural changes necessary to achieve the EFA goals. To realize the potential, the following complementary initiatives should be undertaken:

- legal requirements for education provision (and legal remedies if the requirements are not fulfilled)
- development and continual improvement of engaging and interactive content to be used on technological devices
- expansion and strengthening of electric, mobile, radio, broadband, and wireless networks
- careful consideration of the impact of the introduction of technology within a particular community

**Theme Two: Translating ICT-in-Education Policies into Action**

"Why do most ICT policies go nowhere?"

This provocative question was raised during Dr. Robert Kozma’s keynote address for AMFIE 2012. Technology has changed the structure, goals, processes, and outputs of economies around the world. However, despite the widespread development of ICT-in-Education policies, most systems of classroom organization, student assessment, student activities, and teacher professional development look the same as during the beginning of the twentieth century.

Dr. Kozma identified several reasons for the lack of change, beginning with the predominance of project-based thinking. ICT-in-education policies fail to transform education systems because they fail to incorporate a coordinated and coherent set of changes, fail to break free from organizational isolation, and fail to specify measurable goals. Dr. Kozma proposed a ‘knowledge ladder’ framework (see box) by which countries could realistically assess their education system’s status and set a series of five-year plans to enact changes.

<table>
<thead>
<tr>
<th>Policy Goals</th>
<th>Basic Education</th>
<th>Knowledge Acquisition</th>
<th>Knowledge Deepening</th>
<th>Knowledge Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase primary school enrollment Increase participation in the formal workforce</td>
<td>Want to produce a graduates able to make positive contributions to the economy</td>
<td>Knowledge is used to innovate and add value to the economy</td>
<td>Develop a creative, innovative citizenry engaged in lifelong learning</td>
<td></td>
</tr>
<tr>
<td>Reliant on minimally trained teachers Primarily lecture-based pedagogical model</td>
<td>Focus on standardized delivery and standardized outcomes</td>
<td>Integration of key concepts within curriculum in ways that connect with the real world</td>
<td>Teachers are knowledge creators and innovators Students build on each other to learn and expand</td>
<td></td>
</tr>
<tr>
<td>Focus on developing literacy and numeracy Traditional means of assessment</td>
<td>Basic content knowledge Goal is to increase student performance on standardized tests</td>
<td>Deep understanding of the skills necessary to undertake complex tasks</td>
<td>21st century skills are explicitly embedded in the curriculum Self-assessment by students and teachers</td>
<td></td>
</tr>
</tbody>
</table>
Dr. Kozma provided the following steps for successful ICT-in-Education policy

Formulate a vision of society in the future. Include the skills that you wish citizens to have. Consider how you want technology to enrich schools and classrooms in the future.

• Create a long-term plan with a defined trajectory to achieve your vision. Consider a series of cascading five-year plans and short-term projects that work towards the final goal.

• Build alignment both within and between agencies. All departments within the Ministry of Education need to collaborate, as do all government Ministries.

• Use ICT as a lever for complementary changes to the education system. Consider altering mechanisms for professional development, student assessment, and school organization

• Provide resources and find partners. Consider teaming with non-governmental actors, civil society organizations, and industry leaders.

• Conduct evaluations and revise your plans accordingly. Ensure that you have the mindset and flexibility to make necessary changes.

Singapore stands as the pre-eminent example of a country progressing along the knowledge ladder through the implementation of a series of linked Master Plans. A fine-grained example of Singapore’s Master Plans in action was given during AMFIE 2012 by the Principal of the Crescent Girl’s School. She described the progression from the initial introduction of technology into the classroom and training of teachers (MP1) to the gradual provision of autonomy with schools (MP2) to the current focus of student outcomes and competencies. As the member of the FutureSchools Program, Crescent Girl’s School works closely with the Singaporean government and technology industry partners to test innovative uses of technology in the teaching/learning process.

An additional example of education policy in a technologically advanced nation was provided by the Korea Education and Research Information Service (KERIS). KERIS’ “Smart Education” policy comprises five interrelated strategies, namely 1) promotion of online classes and assessments, 2) sharing of educational content and establishment of a safe environment, 3) establishment of a platform for cloud-based education services, 4) building teacher capacity for ICT-enhanced education, and 5) expansion and application of digital textbooks. KERIS’ work on digital textbooks began in 2007 with the goal of providing a flexible medium that would change normal paradigms of classroom-based learning. Numerous pilots have been undertaken, and KERIS anticipates that laws and regulations will be altered to support the use of digital textbooks throughout the Korean education system by 2013. KERIS has found positive effects of digital textbooks on reducing the gap between urban and rural schools and between high- and low-performing students, as well as increases in student achievement and satisfaction with learning. However, the achievement gains were not as substantial as might be hoped, and negative effects were found with both teacher satisfaction and the return on investment.

The issue of policymaking for large education systems was also discussed during the AMFIE 2012. China’s Vice Minister for Education, provided an overview of the People’s Republic of China’s Ten-year National Plan for Educational Informatization and Action Plan for Digital Education, touching on the need of the government to establish market rules and regulations in order to encourage enterprise involvement. The Head of Indonesia’s ICT Center for Education, provided further details on the management of a large-scale
education system. With over 300,000 schools and 3 million teachers dispersed across the world’s largest archipelago, Indonesia has developed Rumah Belajar (House of Learning) as an online ‘one-stop shop’ platform for education services. Learning management, student records, classroom materials, and teacher professional development are all combined into one universally accessible platform.

More inclusive approaches to policymaking were also presented. In the Argentinian context, each of the twenty-five provinces is in charge of its own education system and agreement on the minimum level of policies is by consensus. The Education Minister for the Haryana State in India provided another perspective on policymaking. A draft plan for ICT-in-Education from 2011 through 2025 is currently in the public domain, receiving input from across the country before being implemented. Allowing public comment on education plans shows understanding of the universal responsibility for education across a nation, and also raises accountability of public officials to fulfill their mandates.

Several country delegates raised the issue of funding such wide-ranging policies as recommended by Dr. Kozma. It was noted that development funding from international organizations, while greatly appreciated, tended to fall into the ‘project-focused’ category. Further questions were raised on the potential for industry leaders to lower the prices of technology purchases for educational uses.

Universal Service Funds (USF) were proposed as a viable means to increase available monies for ICT-in-Education projects. USF are normally provided to the government as a portion of telecommunication revenues, with the mandate to be used to preserve and advance universal service. As the provision of ICT to schools and libraries falls under this mandate, USF can be a viable source of funding for the education sector.

Looking forward
The spread of ICTs and the expansion of educational opportunities have similar power to transform societies. Uniting these forces in a coherent plan can place a society on the path to ‘knowledge creation’ and introduce the possibility for perpetual innovation to solve pressing global problems. Dr. Kozma emphasized how the potential to build a knowledge society had served as the primary justification for ICT-enabled transformations in national plans ranging from Singapore to Rwanda. Extending the discussion of ICT-in-Education to a broad-ranging societal transformation is a key way to involve actors beyond the Ministry of Education, and thus ensure greater success of initiatives.

However, Dr. Kozma’s provocative question should not be blithely ignored. Despite the best of intentions, many ICT-in-Education initiatives will fall short of meeting their goals. The reason may be not a failure of planning, but a failure to understand the nature of technology itself. ICTs continually evolve and develop, and each iteration of a particular product can see improvements by magnitudes of order. An ICT vision reliant on landline connections would fail to take advantage of the revolution in mobile phones. Similarly, the provision of tablet computers, while certainly forward-looking, could become outdated even before a five-year plan has concluded.

While the eventual obsolescence of technology has long been understood, the speed of change is increasing. It took generations for steam-powered vessels to replace clipper ships, decades for the telephone to oust the telegraph, and years for email to supplant postal mail. The spread of ICTs means that the proliferation and uptake of new technologies will continue to accelerate. Therefore, the final vision of any knowledge society must be based on the ability to create, not simply to use.

Theme Three: Training, Supporting, and Evaluating Teachers for ICT-in-Education
The central place of teachers in the education process is accepted globally. Therefore, a consistent theme of AMFIE 2012 was the need for specific policies and projects targeting teacher competencies in the digital age.

Without training, instructors will teach the way they were taught. Without and support, traditional pedagogies will likely remain in place, threatening the use of technology to spark a true innovation in learning. Don Knezek of the International Society for Technology in Education (ISTE) noted that teaching is no longer an isolated endeavor and must model 21st century professional behaviors. Teachers need to be both digital workers and
digital learners, utilizing the full range of tools at their disposal in the internet age. To support policymakers in this endeavor, ISTE and UNESCO have each developed detailed ICT Competency Frameworks for teachers. Each of these frameworks provides set standards by which teachers can be evaluated for their ability to utilize ICT in the classroom.

UNESCO’s standards are divided into six areas with three separate phases for each area. This provides a structure for eighteen separate modules for teacher training and assessment. When implementing the modules, the focus should be on pedagogy over technical knowledge, as technical training for teachers must be translated to the classroom for success.

The necessity for this translation was also mentioned in a presentation by the principal of Singapore’s Crescent Girls’ School. Singapore’s First Master Plan for ICT-in-Education trained teachers in the use of Excel, Photoshop, and other programs. While there was a high degree of excitement around this mass training, results were not seen in classrooms until the advent of the Second Master Plan. MP2 gave schools more autonomy over choosing their training needs and budgets, while simultaneously placing responsibility for teachers to ‘cascade training throughout their schools. By MP3, individual teachers were considered to be researchers, tasked with conducting their own experiments on ICT-enabled lessons and spreading knowledge of success.

A more recent example of mass teacher training was provided by Thailand’s OTPC program. The personnel development plan for OTPC started with the identification of ‘super-trainers’ with high ICT skills in June 2012. Trainings on the use and importance of the tablet computers were carried out first with school supervisors, then with all Grade one teachers, and finally with students and parents themselves. Teachers underwent four day workshops on implementing the 200 day tablet-enabled lesson plan into their classrooms. Notably, the Thai Ministry of Education has a detailed evaluation plan in place. Cluster teams of supervisors, master teachers, and university students will visit schools regularly, and observations of classroom practice will begin on a weekly basis. As with any large scale plan, it will be critical for OTPC’s evaluation team to maintain independence and rigor in their work.

Looking forward

Students have always been the focus of education policy. The rush to bring technology to the classroom begins (and, unfortunately, often ends) with plans to place computers, smartphones, and tablets in the hands of eager pupils. These plans are seen as part and parcel of building ‘digital-age learning skills’ throughout a school.

To ensure that these infrastructure purchases are not wasted, teachers must be equipped with the knowledge, skills, and perspectives for integrating ICT into the classroom. Failing to address teachers in ICT-in-Education plans is a sure recipe for failure. That said, spreading best practices for implementing technology into teaching are now, and may always be, a process of exploration and discovery. Providing technical training is only the first step towards enabling teachers to be active participants in that process.
Recommendations from AMFIE 2012

Policy Recommendations

**Engage in holistic, multi-sector and multi-year planning**

Describing why certain companies are able to achieve exceptional performance, management guru Jim Collins wrote that “good is the enemy of the great”. In the business world, satisfactory results in limited arenas can actually inhibit progression towards sustained greatness.

For education policy, this means that short-term, isolated projects can work against the creation of a knowledge society. Instead, it is essential to bring together actors from across government sectors to formulate a long-term vision, robust enough to withstand administrative turnover. This vision should serve as a common thread knitting together the wide range of projects undertaken as part of the enhancement of ICT-in-Education. Furthermore, engaging cross-sectoral actors will allow for the budgeting beyond the Ministry of Education, thus providing the funds necessary for large-scale transformations to take place.

The holistic view must translate to the plans themselves. The ‘instructional core’ of any school comprises teachers, students, and content. Successful reforms should not only target one of these elements, but also address the interrelated impacts of changes taking place on the other two. For example, plans to implement ICT-enabled content into daily lessons must consider how teachers will deal with the alterations as well as how students will react to the new content.

**Enhance public-private partnerships for strategic policy implementation**

Government support has long been a driver for technology research. Indeed, the roots of the Internet itself began with defense programmes for dispersed networks funded by the United States government. As evidenced recently in Turkey, the demand of technology for the education sector can drive domestic suppliers to improve their production quality and methods. Continuing to engage private sector actors in research and development of educational technologies is a key component of successful ICT-in-Education policies.

Nations seeking to implement ICT-in-Education are confronted by complex problems, including ensuring network coverage to rural schools, creating quality teacher professional development products, and providing adequate resources to bridge digital divides. Solving these problems requires drawing on the full expertise of the international community, including development agencies, multinational companies, and non-governmental organizations.

**Adapt competency frameworks and prioritize data collection**

Setting standards for educational achievement is a long-accepted part of education policy. Indeed, the primary tasks of policymakers should be to determine what students should be able to do at the conclusion of a certain level of schooling and provide schools the resources with which to achieve these goals.

As we move into the information age, these tasks must be carried out for ‘digital literacy’, with competency standards set for both students and teachers. Most importantly, these standards must be measured on a regular basis, with the results shared internationally and used to inform policy adjustments.

**Consider the societal costs of the long term use of technology**

During AMFIE 2012, the term ‘infollution’ was used to refer to the numerous corrosive effects of technology on society. These influences include violent video games, cyber bullying, obscene content, viral rumors, addiction to technology, and invasion of privacy. Educating children (and adults) on how to navigate the
increasingly perilous internet landscape must be included in any long-term policy considerations to ensure the cyber wellness of the users.

Practice Recommendations

Focus on ICT as a lever to achieve for quality education for all

The ‘big picture’ goals for education are quite simple: All children must be able to access a quality education of relevance that enables them to effectively participate in the current society and shape the future. While ICTs can serve an important role in enabling this process, the rush to bring technology to schools all too often obscures, and even overwhelms, these longstanding objectives.

Successful ICT-in-Education programs focus on improving education, not delivering technology. This ethos must be present in all ICT-in-Education plans, and all ICT programs must be structured as solutions for existing educational problems.

Build skills within teaching body as a route towards a shared vision

Bringing technology into schools represents, by its very nature, a disruption in traditional means of teaching and therefore a threat to established instructors. Unless teachers perceive ICT to be a means to improving their practice, even the most sophisticated tablet computer will gather dust in the classroom cabinet.

Providing teachers with the skills to utilize ICT-enabled lessons allows the vision of ICT-in-education to be shared at the front lines of an education system. A teacher who feels that she is a valued user of technology in education, not a target for replacement, will take on new responsibilities within the classroom, catalyzing change throughout her school. Regardless of the reform, empowering teachers to serve as primary agents for change is necessary for success.

Utilize demonstration schools as a means of testing and spreading innovations

Perhaps the most consistent message of AMFIE 2012 was that there are no guaranteed methods of success for ICT-in-Education. Successful replication of best practices remains uncertain, even from such digitally advanced countries as Singapore and South Korea. Unfortunately, domestic pressures often force large-scale implementation of technology solutions before proper piloting can take place.

As any researcher can attest, no technology product is released into the market without thorough testing and modifications. The regular release of both hardware and software updates speak to the continual evolution of technological progress. A similar approach must be taken to the development of ICT-enabled education. Therefore, it is crucial to build ‘safe places’ within an education system, where teachers can be free to test out new technology and rigorous evaluations can be conducted before mass distribution.

Knowledge Sharing Recommendations

Use pilots and evaluations to prove worth and build consensus

The results from testing ICT-enabled innovation must be spread as widely as possible. There are two compelling reasons for sharing the results. First, putting the results in the public sphere allows for comments and critiques to be provided from a wide range of experts. As knowledge of the pilots spreads, additional actors can join the initiative, bringing new resources into play. Second, ICT-enabled teaching methods, like all educational innovations, must be subject to the burden of proof. Given the substantial cost outlays associated with many ICT programs, a demonstration of their educational value is necessary to assuage both domestic and international stakeholders.

Share data, policies, and programs

Policy questions on the use and impact of ICTs in educational settings around the world are complicated by the lack of reliable, globally comparable data and models for policy setting. The UNESCO Institute of Statistics (UIS) has developed a robust set of indicators for ICT-in-Education and the World Bank is in the process of assembling a global database of ICT-in-Education policies. Providing both historical and current information
to these databases will increase their value for researchers, policymakers, and educators alike. Furthermore, continual engagement through conferences and forums at the global, regional, and sub-regional level will facilitate important connections.

**Think beyond your borders**

The spread of ICTs has changed our world. Lines of production and communication cut across national boundaries, and education is rapidly following suit. ICT will enable new forms of educational connections. Plans are already in motion for ASEAN Connectivity 2015 and international student mobility is on the rise across the Asia Pacific region. The potential to resolve both access and quality issues will only increase as policymakers and practitioners consider a borderless education system.
Appendix: Follow-up Evaluation

In order to provide time for plans to be set, a follow-up evaluation was distributed three weeks following the forum's conclusion. While responses were not sufficient for statistical analysis, respondents to the evaluation did provide some insight into plans for future projects inspired by AMFIE 2012. The AMFIE organizers are hopeful that these and other initiatives inspired by the conference will provide a pathway for strengthening ICT-enhanced learning throughout the Asia-Pacific region.

Representatives from Laos PDR indicated that they were pursuing a long-term development plan drawing support from Intel's Educational Transformation Model and Master Plan Development Tool. Financial supports and policy guidance were both indicated as necessary areas of external support for this project to work. Laos PDR will also analyze China's Ten Year Development Plan for ICT in Education for guidance on the use of Teacher TV as a means of improving the quality of instruction for rural areas. Additional research will be done on the KERIS Digital Textbook Project from South Korea. Laos PDR has already set up 17 schools to serve as ICT resource centers, though much work needs to be done for content developments.

The development on a large-scale Master Plan was also a priority for the Ministry of Education in Bhutan, with hopes to utilize Intel's Education Transformation Model and Master Plan Development Tool. Bhutan also indicated that they will be starting an ICT-integrated lessons as a pilot project in 20 schools in 2013, drawing upon Thailand's teacher preparation as a model.

The Ministry of Education in Brunei Darussalam, meanwhile, will be continuing the development of its Whole School ICT Development strategic pathway by setting out a framework for teacher competencies similar to ISTE's Global Digital-Age Skills for Teachers and implementing an integrated database for students and teachers to share information. Additionally, Brunei intends to conduct a feasibility study to determine the potential for digitizing textbooks following a benchmarking visit to the Republic of Korea to learn more about the KERIS Digital Textbook Project.