

## International Conference

Summary Proceedings

16–18 October 2007 • Asian Development Bank, Manila, Philippines

### INTERNATIONAL CONFERENCE ON ICT FOR EDUCATION

*Optimizing ICT for Education. Sharing Practical Experiences from the Asia and Pacific Region:  
What Works, What Doesn't, and In What Circumstances  
16-18 October 2007, ADB in Manila, Philippines*

#### SUMMARY OF OUTCOMES AND NEXT STEPS

##### OVERALL SUMMARY

The conference brought together a wide range of stakeholders in the area of ICT for education, including senior policy makers and planning officers, researchers, private sector stakeholders and NGOs, and development partners. The conference raised awareness among its delegates about the importance of ICT for national development, and the importance of ICT for education in improving education quality and delivery.

The 3 days session contributed clarifying concepts and ways of doing ICT for education. The conceptual clarity is important for meaningful policy development. The conference outcomes strongly highlight the need to develop comprehensive national ICT for education policies and regulatory frameworks within which sector specific ICT for education policies and strategies can be adequately pursued. The outcomes highlight the need to adequately contextualize ICT for education development and implementation to suit the needs and realities of individual developing member countries of ADB, and the need to pursue innovative and cost-efficient, less sophisticated, and more sustainable solutions (which in certain country contexts can add much more value in terms of supporting teaching and learning than highly sophisticated and expensive, but less contextualized and less sustainable solutions). All countries highlighted the need of cross-sector work, a major involvement of other partners in the telecommunications, energy, finance, and infrastructure sectors, for meaningful implementation of ICT policies in the education sector.

The conference focused extensively also on costing, total cost of ownership (TCO), financing of ICT for education, and the potential of public & private partnerships (PPPs) in ICT for education. Awareness of the need to develop appropriate regulatory frameworks to support ICT for education, including meaningful financing arrangements, was highlighted. Clearly private sector in Asia and Pacific is increasingly advocating their role in supporting development and implementation of ICT for education, and clearly appropriate synergies for PPPs exist in this field. Governments and Ministries of Education increasingly understand the *potential and necessity of PPPs in this field*.



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Government delegates from ADB's developing member countries included representatives of key national bodies and line ministries, which are contributing to ICT in education development and financing issues, such as ministries of education, ministries of ICT/telecommunication (or equivalent bodies responsible for national ICT policies and strategies), as well as ministries of finance. The conference also included participants from development organizations, both public and private, who are involved in planning, implementing, and monitoring ICT in education policy and strategy developments or technology applications. Representatives from selected private sector firms also attended, presenting experiences, products, and solutions in this area.

Close to 200 participants attended, bulk of whom were delegates from ADB's developing member countries and representatives of private sector stakeholders.

The conference succeeded in sharing among a diverse group of participants a wide range of current ICT in education issues, lessons learned, and best practices, including broader policy and strategy questions as well as innovative approaches, practical solutions, hands-on toolkits, cost implications, and sustainability of benefits of ICT in education.

Resource speakers included experts from ADB's two regional study projects, and public and private sector stakeholders. During the conference, a concurrent three days "ICT in Education Expo" took place, bringing experiences, products, and solutions from the private sector. The Expo gave participants practical examples and the opportunity to interact with innovative ICT for education solutions.

In addition to plenary and panel sessions on broader ICT in education policy and strategy frameworks, the conference offered concurrent stream sessions on specific ICT in education topics, such as regulatory, telecommunication, financing, and hardware issues; practical solutions for e-teacher training and e-learning materials; specific country reports; and successful public & private partnerships.

An innovative highlight of the conference was the use of an interactive Web site, "Wiki" for the purpose of the conference, that enabled the organizers and participants to post and access information during and after the conference, through wireless connections. The Wiki provided an efficient forum for sharing presentations, other reports from conference sessions, flyers, handouts, biographies of speakers and sessions facilitators, photographs, videos, and most importantly, provided an additional forum for dialogue and discussion among the participants. The Wiki has remained accessible among the conference participants also after the conference, and will be eventually maintained as a subpage at ADB's education sector website. Possibilities to transform it further to a community of practice e-forum on ICT for education issues are being explored.



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The conference not only allowed ADB's regional study teams in ICT for education to share findings and experiences, but also triggered lively discussions and questions from and among conference participants. Some further discussion and presentation sessions on certain specific topics organized by participants during tea and lunch breaks offered additional knowledge sharing opportunities.

### NEXT STEPS

There is a need to continue emphasizing the importance of contextualization and needs analysis in this development field, supported with adequate policies and strategies, prior to investment decisions. In addition, adequate cost estimation, TCO analysis, and sustainable financing issues, including potential of PPPs in this field need to be more addressed in the context of individual countries. The tool for ICT for education cost estimation developed by ADB will be utilized.

In the coming years this approach will be further strengthened through ADB's loan/grant projects in education, and through further specific studies, capacity development initiatives and awareness building activities to be implemented by ADB together with stakeholders and partner organizations in the Asia Pacific region.

In addition cross sector work, including telecommunications, infrastructure and energy specialist should become part of best-practice interventions in ICT related work to ensure maximized efficiency and long-term returns over investments.

### SUMMARIES FROM CONCURRENT SESSIONS

#### Stream 1. Regulatory Frameworks, e-Readiness, Telecom, Hardware: Issues and Trends

**Stream 1 session in day 1** was based around three presentations focusing on *Conditions Controlled by Government That Have A Positive Effect on Nurturing Innovative ICT in Education; National Strategies for ICT in Basic Education; and ICT in Remote Schools.*

Together these presentations gave an overview of planning and implementation at three levels: the national, education sectoral, and local rural school levels. Using the presentations as the basis for discussion, the group debated issues of planning and regulation – specifically the need for fully integrated ICT for education strategies from policy to pupil.



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From the debate emerged five main observations:

1. The need for comprehensive education planning and specific ICT in education planning that integrates into national ICT plans.
2. The duty of governments to create an enabling environment for ICT for education– with both tangible and intangible strategies.
3. Realistic planning that takes account of the availability of human and financial resources to ensure sustainability of ICT for education.
4. The planning net: the interdependence of all planning from school to national levels with all the stakeholders involved in the process and having these plans integrated to form a durable whole.
5. The need for transparent regulation and enforcement to attract investment in connectivity, to support ICT for education.

The session also discussed the dependence of ICT on a wide range of external factors from electricity supply to the pros and cons of open source software, and how these should be built into the planning, regulation, and enforcement policies. Issues of total cost of ownership (TCO) were debated, and it was observed that the elements that make up TCO are to some degree different in each country, however the conclusion was that TCO can always be calculated and is a key and necessary factor in good ICT design, including designs for ICT for education.

The overall conclusion of the debate in this session was the need for realism in making ICT plans and having clear objectives as to the desired outcomes – summed up by the phrase ‘the art of the possible’.

**Stream 1 session in day 2** had a major focus on financing ICT for education. Presentations focused on issues of *Financing ICT in Basic Education*, and through an *Innovative Revolving Fund Scheme*.

The session pointed out that available evidence suggested that there was a lack of existing research in all aspects of ICT usage and financing in developing countries and in transitional economies. As a result, little is known about the true costs of ICT in education and few donor projects or government computerization programs have a clear idea of the total costs of introducing and maintaining ICT as a classroom tool. Most investment is concentrated on the purchase of hardware and few countries have made adequate provision for replacement costs, for the operational costs of power supplies, connectivity, consumables and maintenance, nor for the associated costs of teacher training, software development, curriculum development and assessment. ADB's RETA study for ICT in Basic Education in Central Asia generally confirmed the main conclusions specified above. The six Central Asian countries were all unaware of the costs of ICT provision and operation and were largely concerned with the front end costs of



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hardware procurement. None of the six Central Asian countries had made financial projections to cover replacement costs. None of the countries had made satisfactory provision for operational costs and the costs associated with ICT introduction, and in particular teacher training costs, had been widely underestimated. Because recurrent and associated costs had not been accurately calculated, projected, and provided, there has been quite widespread under-use, misuse, or non-use of the expensive hardware provided.

The session presentations covered also Armenian national program for the introduction of ICT into basic education for the period 2004-2008. This presentation reviewed the rationale for investment in ICT in basic education and specified that the main objective of the investment was to improve pupils' learning outcomes through the use of ICT and to increase the quality, effectiveness and efficiency of teachers in schools to enhance the delivery of the curriculum. Armenia had decided that the right vehicle for the introduction of ICT into basic education was not through standard computer laboratories but through School Learning Centers supported by a school network and the establishment of a national ICT centre for coordinating and managing the national program. Of particular note was Armenia's decision to identify and cover the costs of ICT operations by the state rather than by leaving it to individual schools. Thus, recurrent connectivity costs, power supply costs, consumables and maintenance and servicing were all charges on the state budget in Armenia. In this way Armenia aimed to ensure the effective utilization of the hardware and the software and to avoid the problems of the under-financing of operational expenditure which was a feature of many ICT in education projects in the country. Armenia has also introduced a voluntary computer revolving fund to enable schools who wish to develop their ICT resources to purchase low cost hardware at interest free rates in advance of MOE hardware provision.

There was much discussion and many questions arising from these two presentations. There was a widespread acceptance in the audience that the full costs of ICT had not been identified by many of the developing member countries of the ADB and there were requests for information as to how these costs could be accurately identified and calculated. ADB's RETA for ICT in Basic Education in Central Asia was developing costing spreadsheets to help in costing. Information was provided also on an existing UNESCO costing guidelines, which are already available on the web. Further clarification was sought on the costs of connectivity, power supply, consumables, and servicing and maintenance. The presentation on the computer revolving fund generated a lot of interest and discussion, and detailed information on this scheme was made available.



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### Stream 2. Integrating ICT in Schools and e-Resources in Classrooms: Issues and Trends

Sessions in this stream aimed to provide participants with examples and tried approaches on integrating ICT in Schools and e-Resources in Classrooms.

**Stream 2 session in day 1** focused on initiatives on school level, with lessons learned and insights into initiatives from Mongolia and Samoa, and findings from ADB's RETA Study on Innovative ICT in Education analyzing these initiatives.

Participants were provided with both, the big picture of what aspects have to be considered when designing and implementing ICT in education initiatives, and an overview on some specific elements of such critical aspects that define approaches to ICT integration into schools and eResources into classrooms. Presentations, focusing on the conference motto of "What Works, What Doesn't, and In What Circumstances," from Mongolia and Samoa were shared.

The *ICT for Innovating Rural Education of Mongolia* project implemented in 45, mostly rural, schools of the country, focused on providing a tailored and targeted professional development program, e-Resource development approach and equipment package. The professional development program builds on a mentor school approach, where schools in regional capitals supported their peers in the more remote areas of the country. Coupled with direct in-school support, this professional development approach was successful in building not only basic computer skills, but also skills in e-Resource production (mostly PowerPoint presentations) and their integration into classroom teaching. The low-tech equipment package of one laptop, one LCD projector, and one digital camera was appropriate for electricity poor areas and for the purpose to innovate classroom teaching. The project made important experiences in regard to addressing challenges in electricity and resource poor areas.

The *Samoa SchoolNet and Community Access Pilot Project* was implemented in 5 schools. The professional development program, directly training selected champion teachers on school level provided basic computer skills and information about how to use technology for teaching and learning. The equipment and connectivity package featured a unique connectivity design, suitable for the schools' location on the island and computer labs with a thin client configuration. E-Resources development under this project were focused on providing internationally developed, adapted Learning Objects on selected topics to stimulate interest among teachers in using ICT in their teaching. The project made important experiences in terms of addressing challenges, especially related to connectivity in regard to the policy environment in the telecommunication sector.



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The presentation “*Solving the Puzzle – Why Some Pieces Fit and Some Just Don’t*” from the RETA on *Innovative ICT in Education and Its Potential for Reducing Poverty in the Asia and Pacific Region*, showed findings from an analysis of these two initiatives in Mongolia and Samoa, in regard to lessons learned and impact on teaching and learning. The presentation was complemented by a hands-on workshop during the session, actively involving session participants in solving the puzzle of design and implementation of effective ICT in education initiatives. The puzzle activity stressed the importance of aligning educational objectives with project activities and appropriate monitoring and evaluation approaches. In groups, participants elaborated aspects of project design in relation to specific educational objectives for the role of ICT. Such aspects included approaches to professional development, content decisions, equipment packages, teacher pedagogic and ICT support approaches, solutions to fostering sustainability and promotion of appropriate school level ICT policies. Participants worked in two groups during the session. Group 1 considered a possible professional development approach, equipment package, and approach to e-Resource development with respect to “ICT to Support School Management”. Group 2 elaborated on the same elements in regard to “ICT to Enhance Teaching”. Both groups concluded in a presenting their finished puzzles.

**Stream 2 session in day 2** provided a general overview on the intersection between learning, ICT, and e-Resources in the future, complemented by specific examples of e-Resource development from Kazakhstan and Thailand.

The session featured a presentation on *Identifying, Developing, Evaluating, Testing, and Using Local e-Content*, based on experiences in Kazakhstan, where the *Center for Informatization* is looking back on several years of experience in developing local e-Resources for most grades and subjects. Successful in attracting government funding, guided by a strong national policy on informatization, the center has developed electronic teaching and learning materials accompanying most of the national curriculum of grades 1-11. Notably, more than 300 exercises have been produced for mathematics. E-Resources have been developed by teams, including teachers, multimedia producers, designers, and graphic artists, among others.

The *Best Practices in Learning Contents via Multi-media – Capacity Building in Thailand* presentation highlighted important considerations at the outset of an initiative that was to develop electronic teaching and learning materials accompanying the Thai curriculum. With a rather didactic, instructive teaching and learning culture prevalent in the country, it was important to be aware that transformation of learning could not be achieved by simply “changing the color of books”. Instead, it was critical to change approaches and the way people work together. Capacity building therefore became a focus of this initiative. In the process, the project also managed to produce 36 new Learning Objects in Thai along specific aspects of the Thai curriculum. In addition, 16 Learning Objects developed by the Learning Federation (Australia)



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were translated and adapted for this context. Topics were chosen that would benefit from the unique multimedia representation Learning Objects can offer, especially for the acquisition of difficult or abstract concepts.

Presentations on specific e-Resource development initiatives were complemented by an insight into the future of *ICT for Learning*. This presentation highlighted important systemic issues to e-Resources and ICT integration. The talk stressed the need for systemic changes and sector wide transformation in order to leverage ICT for quality learning (rather than learning of ICT), which will be the critical capability needed of educators, schools, and educational systems in the future. The presentation emphasized that ICT needs to be embedded in the teaching not and not be an add-on. In summarizing important lessons learned that were part and parcel of other presentations in this stream, the presentation concluded that success factors in transforming entire education systems by leveraging ICT integration, are approaches that are: *a) student-centered; b) affordable; c) scalable and d) sustainable*.

Session participants enjoyed seeing specific examples of e-Resources developed and asked critical questions in regard to the process of localization and adaptation of foreign Learning Objects to local context. Questions inquired about the process and approaches to content development and their financing. Discussions also focused on sharing e-Resources between countries and the use communities of practice in this regard.

### Stream 3. E-Teacher Training: Issues and Trends

This stream involved presentations and discussions on the use of ICTs in teacher preparation. The presentations covered a wide range of issues, from the school level in low-resource settings, to university-level training through ubiquitous e-learning, to imagining "schools of the future".

**Stream 3 in day 1** involved presentations on *ICT Integration in Schools and Teacher Training in Singapore; A Pilot Study on the Use of Mobile Phones in Teacher Training in Bangladesh; and A Pilot Study on the Use of Video Recording in Teacher Training in Nepal*.

While video is now widely used and accessible for capture and immediate playback--in phones, in cameras, and in video recorders--and therefore much more easily integrated into schools and training experiences, it appears it is not necessarily used as effectively as desired as form of ICT for education.



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A delegate from Nepal, who is involved in the ADB project that the study on video recording was attached to, gave some impressions of how the findings (of both the video and mobile phone studies) might be applicable in Nepal. He shared experiences from Nepal in the use of a radio distance learning mode for training teachers. Although there is a free call-in tutorial center, trainees do not make use of it, even when the phone call is free. The project recognizes that there is a lack of interaction that makes it difficult for trainees to stay engaged. Therefore, it would be ideal to incorporate mobile phone use in the radio distance learning program; however, mobile phone coverage is not yet available in most parts of rural Nepal. The presented agreed with the conclusion from the study in Bangladesh that the technology (mobile phone, in this case) can not be the only mode of transmission of course content--there must be multiple modes, including face-to-face interaction, for training to be effective. In response to the Bangladesh presentation findings, that state that "Distance learning (as designed and delivered in this program) can be as effective as face-to-face", it was noted that further research may be needed in this field. Complementary support from distance education to 'traditional' face-to-face training was emphasized.

**Stream 3 in day 2** included three presentations focusing on *On-line Higher Education Efforts at the Korean National Open University; A Model for ICT School Leadership in India; and A Vision for Global 'Future Schools.'*

All three presentations emphasized that the development focus should not be on the technology, but rather on transforming the way we teach and learn as communities of learners, through multidirectional information flows and shared leadership. The technology is the catalyst that allows this to happen. Furthermore, a key enabling factor for achieving this transformation is having the vision to do so, and the foresight to plan ahead and integrate monitoring and evaluation into the planning process.

A questions and comments from participants focused on issues such as:

- Whether the e-learning platform in Korea was created locally, or purchased from a proprietary source? In response, it was explained that the platform was developed within Korea, but outsourced by the university. All of the courseware is in Korean language. This was seen as a good example of ICT localization of software and content.
- Is it better to start with a school-based model like the one in India, and then gradually expand to reach all schools in the country (bottom-up)? Or, is it better to start by revising the national curriculum goals to require ICT integration (top-down) immediately and then allowing school based models to develop nationwide at the same time? This question remained open for discussion.



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- How to launch future schools? It was explained that the point is not to take the model and apply it directly, but build a vision for future schools (school reform) that takes into consideration the country context, involves a variety of stakeholders, and relates to overall social reform efforts. Most importantly, the technologies are just an enabling factor for this social and educational transformation, but it must emerge from within schools and their objectives.

Stream 3 sessions as a whole demonstrated the difference between learning *about* technology, and learning *with* or *through* technology. A common thread among all of the presentations was the transformative power of ICT to change the way we prepare teachers, and indeed the way we teach pupils in general. It is a transformation towards building communities of learners based on *multidirectional communication*, rather than historical models of unidirectional teacher-to-pupil instruction. This also means that education reform--from 'policy to pupil'--is about building flexible, adaptable schools that can be ready for the future, but also remaining grounded in pedagogy--not technology--based on the context, cultures, and values of the country. Important practical factors to take into consideration are (a) shared leadership, (b) 'foresight' planning (i.e., looking towards the future, rather than correcting errors of the past) based on identified needs and ongoing monitoring and evaluation, and (c) solutions that are based on school-level objectives.

Presentations in this stream also made use of and, in some cases, redefined acronyms such as u-learning (**u**biquitous learning), m-learning (**m**obile learning), c-learning (**c**onnected learning), "e-learning" ('**e**lectronic' or, as redefined: '**e**xpanded', '**e**nabled'), and ICT (becomes **I**nformation **C**ollaboration/**C**onnecting/**C**ulture **C**hange technologies). This discourse reflects the rapid evolution of technologies and their applicability to education.

Participants on both days responded positively, yet critically, to the presentations, and the integration of technology in education. For example, in response to the point that schools have not changed much in 100 years, contrary to major changes in other parts of society (i.e., hospitals), one participant wondered whether or not it was necessary to change the school model if it was working; the historical model of schools has not stopped innovation and progress from being achieved, so perhaps that model does not need to be changed. Therefore, in this sense, the objective of the conference (to help participants determine which technology is appropriate to each country circumstances) seems to have been effectively imparted to the participants, who were not ready to simply apply ICT solutions from one context to another.



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### Stream 4. Public Private Partnerships in ICT for Education.

#### Introduction

Overall, the presentations in stream 4 sessions offered participants a mix of case studies of public - private partnerships (PPPs) operating on the ground, and lessons for the design and operation of PPPs.

The first presentation in ***Stream 4 in day 1*** focused on *Crossing the Digital Divide – Options, Pros and Cons for Affordable Rural and Remote Connectivity*. The presentation examined the digital divide in ICT with a focus on the key power and connectivity problems in the Central Asia region, potential solutions to these problems and guidelines for policy making and strategy formation. The presentation brought out a number of key lessons for policymakers, including the importance of infrastructure to good ICT outcomes, the interdependence between 'new' ICT technologies and 'old' infrastructural technologies and the importance of well-designed school funding systems to ICT outcomes (i.e., focus on both capital and ongoing expenses, need for discretionary funding in school budgets to pay for non-wage costs such as electricity).

The second presentation focused on *Enriching ICT for Education Through A Public & Private Partnerships in Text2Teach Consortium, Philippines*. The presentation was useful in outlining a good example of a strategic ICT partnership involving international, national and local partners. The experience highlighted important lessons for multi-sectoral partnerships, including the importance of clear roles and responsibilities, the contribution that PPPs can make to the sustainability of ICT projects, and the importance of a national strategy to guide partnerships between the public and private sectors.

The third presentation, *Impact and Innovation Through Partnerships in Education* provided a broad perspective on the importance of the knowledge economy, the role of ICT in creating a new learning paradigm, the enabling conditions required for ICT and PPPs in sustainable development.

***Stream 4 in day 2*** focused first on *Innovative Approaches to Teacher and System ICT Support in Schools: Public & Private Partnerships Experiences from Azerbaijan*. The presentation discussed the AzNET Project, a PPP involving the Government of Azerbaijan, the UNDP, the Open Society Institute (Soros Foundation) and the Azerbaijan Research Educational Network Association. The objectives of the project were to develop an accessible and reliable ICT network infrastructure, to improve the availability of skilled human resources and to increase the awareness of opportunities of ICT. The presentation highlighted a number of issues to inform the development of PPPs in ICT, including the importance of linking initiatives to wider



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government strategies, the need to build in mechanisms to ensure ongoing sustainability and scalability when designing ICT initiatives, the role that PPPs can play in providing access to skilled IT workers, the role of individual ICT initiatives in driving changes to the wider policy environment and the importance of project advocacy to project sustainability.

The remaining two presentations of the session focused on *Global Classroom Connection (GCC)*, and *The Nature of the Bridge to Cross the Digital Divide, Ink-Media PC*. GCC seeks to connect the world's youth by building networks of classrooms around the world. Ink-Media PC is a low cost (target price is <\$US300), portable, ROM-based personal computer. Both of these presentations highlighted innovative private sector ICT initiatives that aim to assist countries to meet their wider developmental objectives.

As a whole, the stream 4 sessions generated strong interest among the conference participants. The session presentations and deliberations highlighted various useful and important aspects of PPP strategies and models in ICT for education field. Governments are still rather cautious about PPPs, regulatory frameworks are not yet very advanced to support PPPs effectively, and the potential of PPPs, therefore, is yet to be realized.

