



# Information and Communication Technology (ICT) as a Catalyst for Change: A Regional Study on Innovative ICT in Education

As ICTs become more accessible and affordable, there is a growing interest in testing how various technologies can help developing countries mitigate challenges—such as inadequate infrastructure and unreliable communication networks between urban and rural areas—and improve the livelihoods of marginalized populations. In the Asia–Pacific region, governments are taking a particular interest in exploring whether ICTs can help improve the quality of education, including teacher performance and student learning.

With funding from the Asian Development Bank (ADB), RTI International, in partnership with iEARN-USA, conducted an investigation of the effective use of ICT for education in rural areas of Bangladesh, Nepal, Mongolia, and Samoa, from April 2006 to September 2007. The RTI team linked with existing ADB-funded education projects in each of the four participating countries, and also researched experiences in Cambodia, Thailand, and the Philippines.

The study, *Innovative Information and Communication Technology in Education and Its Potential for Reducing Poverty in the Asia and Pacific Region*, included three major components

1. Investigating national policies and strategies promoting appropriate and increased use of ICT for education
2. Evaluating the ability of e-resource (electronic teaching and learning materials) initiatives to enhance classroom teaching in rural Mongolia and Samoa
3. Appraising the potential for e-teacher training (ICT-supported professional development) to increase access to quality teacher training in remote areas of Nepal and Bangladesh

Findings highlighted promising models of ICT for education, identified drivers and barriers to successful ICT integration, and culminated in October 2007 in a high-level international conference at ADB headquarters in Manila, the Philippines, to share lessons learned.



*Students at Vaimauga College in Samoa are eager to use new technology at their school. [Photo: Ruby Va'a]*

## From policy to pupil: How governments can encourage ICT in education

For ICT interventions in education to be effective in rural areas, government policies and strategies must first create an enabling environment for ICT integration and promote geographic extension of ICT-supported teaching and learning opportunities to remote populations.

Through field visits, interviews, and desk research, the RTI team investigated broad issues. Topics included awareness and perceptions of ICT's role in education; issues of access, affordability, and demand; and legal and regulatory matters that affect ICT adoption for improved teaching and learning. The RTI team found that a comprehensive ICT policy and strategy is key to creating an enabling environment for effective use of ICT for education. Findings indicated a need to establish stronger independent and transparent regulatory bodies, backed by enforceable law, and to stimulate greater public awareness and demand. Further, use of appropriate tools that encourage effective integration of ICT for education—such as institutionalizing integrated ICT planning at the national and sectoral levels; applying taxation, licensing, and special technology

*(continued)*

development funds; establishing centers of excellence; and fostering public-private partnerships for education—must also increase. Most critically, the study found that sustainable ICT integration can only be achieved when driven by educational objectives, not technological desires.

### Effective integration of ICT in schools and e-resources in classrooms

The study documented lessons learned, good practices, and successful approaches on integrating ICT in schools and e-resources in classrooms. The RTI team compared indicators of teaching quality and ICT integration between 8 Mongolian schools that participated in e-resource initiatives (implementing schools) and 4 schools that did not (control schools). They also analyzed six school technology case studies in Samoa.

In Mongolia, implementing schools exhibited higher levels of job satisfaction, collaboration, and use of diverse teaching and learning materials among teachers. In these schools, students also had more frequent access to computers, despite a more limited supply of functioning machines than in control schools.

The comparison helped define drivers and barriers of effective ICT integration at the teacher, school, and national levels. Conclusions also outlined successful approaches and provided detailed recommendations for upcoming education reform projects.

*“I usually share the electronic teaching material I developed with other teachers, something I did not do before with my lesson plans or other materials. It really helps to get feedback from my colleagues on how to improve my presentations or methodology.”*

—Teacher in Jinst, Mongolia

### Improving teacher training with technology

By working with two teacher training programs in Nepal and Bangladesh, the RTI team found that a combination of carefully integrated, locally tailored technology and training can improve rural teachers’ perceptions of training and performance and reduce feelings of isolation by connecting them to a community of teaching peers.

In Nepal, mobile teacher training teams in remote areas were provided a laptop, digital video recorder, and training on basic operation and pedagogical use of the equipment. After 2.5 months, trainees using ICT tools to replay lessons and review footage of themselves giving class presentations reported measurable improvements in their retention of



Poster in the computer lab of a teacher training college in Dhaka, Bangladesh.  
[Photo: Babi Kafle]

training material, understanding of teaching practices, and self-confidence. They also expressed a higher degree of satisfaction with the training program and motivation to participate when technology was included.

In Bangladesh, a cluster of 10 schools was equipped with mobile telephones with advanced multimedia and communications features. Teachers participated in a 6-week distance learning program for Bangla and math teachers, which was previously delivered only as a 2-week, face-to-face training course. The main objective was to determine the suitability and impact of telephone-supported, in-service distance learning for professional development. Participants’ feedback and pre- and post-training test scores revealed trainees’ overall satisfaction and strong preference for the distance mode of training, which allowed them to remain close to their homes and classrooms. Results demonstrated content-knowledge gains equivalent to those of participants in the traditional face-to-face program.

The study’s conclusive results underscore that ICT can positively affect the teaching and learning process and teacher training if the design and implementation of ICT initiatives: 1) account for critical conditions—such as teacher motivation and incentives, school-level pedagogical leadership, and systemic organizational change; and 2) recognize the essential value of aligning ICT policies and strategies, equipment packages, and professional development with specific education development objectives.

Prepared by RTI International, under ADB TA No. 6278-REG, Contract No: COCS/60-026.

#### For more information, please contact

Information and Communication Technology (ICT) Program  
Gordon Cressman, Senior Director  
E-mail: gmc@rti.org  
Phone: +1 919.541.6363