

Central Asia Symposium on ICT in Education 2013: Innovative ICT Practices on Lifelong Learning

OUTCOME DOCUMENT

English version

in partnership with:



MINISTRY OF
EDUCATION AND
SCIENCE OF THE
REPUBLIC OF
KAZAKHSTAN



United Nations
Educational, Scientific and
Cultural Organization



UNESCO Institute
for Information Technologies
in Education

Central Asia Symposium on ICT in Education 2013

Innovative ICT practices on Lifelong Learning

Outcome Document

English version

UNESCO Bangkok

UNESCO Institute for Information Technologies in Education

UNESCO Almaty Cluster Office

Published by UNESCO Bangkok
Asia and Pacific Regional Bureau for Education
Mom Luang Pin Malakul Centenary Building
920 Sukhumvit Road, Prakanong, Klongtoey
Bangkok 10110, Thailand

ICT/13/007-E

Cover image derived from www.webdesignhot.com
as a free vector graphic, licensed under Creative
Commons Attribution 3.0. (EPS Graphic File:
Abstract Blue Background Vector Graphic 4)

Table of Contents

Introduction	1
Regional and Sub-regional Context.....	2
Lifelong learning.....	2
A changing world	3
ICT in education	4
Summary of Country Presentations	5
Republic of Kazakhstan.....	5
Kyrgyz Republic	7
Mongolia	8
Republic of Tajikistan	10
Turkmenistan	12
Uzbekistan.....	13
Emerging trends and common challenges.....	15
Conclusions and Recommendations.....	18

Introduction

During the International Symposium on ICT in Education (13-14 September 2011, Mongolia), Central Asian countries reported on their policies, promising practices and lessons learnt in the use of ICT in education.¹ At the follow-up 2013 Symposium, it was acknowledged that many countries in this region face common challenges in improving education and employing ICTs in education. To collectively address these challenges, it was agreed that a shared sub-regional platform, where government officials and experts could discuss practices in using ICT in education and policy options, should be created.

Considering the similar contexts and challenges faced by the Central Asian countries, i.e. scattered population in vast territories with nomadic tradition, ICTs can play an important role in reaching the unreached and promoting universal access to quality learning in countries of Central Asia. But in an increasingly connected and rapidly changing world, providing access to quality learning requires more than the provision of equal access to school education. In reality, it requires a system-wide educational reform, the kind of reform where learning beyond formal education is encouraged and multiple channels to diverse learning opportunities are recognised. Open access to learning throughout life is well-recognised as vital to developing the skills needed in an increasingly knowledge-based society. For arguably the first time in history, information and communication technologies are making access to lifelong and life-wide learning for all possible. It could not be more timely to review the promising policies and practices in ICT-supported open and distance learning among the countries of Central Asia.

To this end, the **Central Asia Symposium on ICT in Education (CASIE)**, held from 28-30 January 2013 in Almaty, Kazakhstan addressed two specific themes:

1. ICT-enhanced policy formulation and management to support lifelong learning; and
2. Innovative practices on open and distance learning, including mobile and smart learning technologies, as well as use of free and open software (FOSS) and community-based ICT learning centres.

The Symposium was organised by UNESCO Asia-Pacific Regional Bureau for Education (UNESCO Bangkok) with financial support from the Government of Japan and in collaboration with the Global Scientific Information and Computing Centre, Tokyo Institute of Technology (Tokyo Tech). The Symposium was also supported by Ministry of Education and Science, Republic of Kazakhstan, UNESCO Cluster Office in Almaty and UNESCO Institute for Information Technologies in Education (IITE). Government officials from six countries (Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Turkmenistan and Mongolia) participated in the Symposium, together with international experts from the Asia-Europe Meeting e-Learning Network for Lifelong Learning (e-ASEM Network)², Tokyo Tech, Korea Institute of Science and Technology (KIST), and IREX.

The objectives of CASIE 2013 were two-fold:

1. To provide a platform for national education policy makers, practitioners and development partners to share issues and challenges shared by Central Asian countries in integrating ICT

¹ Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, and Uzbekistan participated in the said symposium co-organized by UNESCO Bangkok and Tokyo Institute of Technology (Tokyo Tech) (<http://www.unescobkk.org/education/leading-the-international-agenda/ict/ict-in-education-projects/policy/international-symposium-2011/>)

² Also known as the ASEM Education and Research Hub for Lifelong Learning (ASEM-LLL) Research Network 1.

- into the education systems. This involved particular emphasis on the use of ICT for policy formulation and ICT-supported open and distance learning towards enabling lifelong learning.
2. To promote collaboration and partnership among the Central Asian countries in the identification of solutions to shared issues and challenges prohibiting the effective and efficient use of ICT in Education.

In view of these objectives, discussions focused on the following main topics:

- Policies and initiatives to promote lifelong learning through ICT;
- Use of ICT for planning and managing lifelong learning policies; and
- Open and distance learning through various ICT-supported modalities.

Regional and Sub-regional Context

Lifelong learning

Given the increasing attention it gets in the development of government policies worldwide, lifelong learning has become something of a buzzword, particularly in education policy circles. But lifelong learning is in itself not a new concept. In fact, it was Aristotle, the ancient Greek philosopher who said, "Learning is an ornament in prosperity, a refuge in adversity, and a provision in old age." And it was Gandhi who preached, "Live as if you were to die tomorrow. Learn as if you were to live forever." These ideas are not novel to countries of Central Asia, rather it is an idea we all share across the globe.

UNESCO has continued to promote a culture of lifelong learning, as reflected in the 1972 Faure Report, in the very definition of basic learning needs, established at the 1990 World Conference on Education for All in Jomtien, Thailand, and of course, in the well-known 1996 Delors Report on the four pillars of learning. As the Faure Report boldly stated: "We propose lifelong education as the master concept for educational policies in the years to come, for both developed and developing countries." The Delors Report extended this further, identifying "learning throughout life as the very heartbeat of society and key to the twenty-first century". To the Delors Commission, lifelong learning is supported by four pillars: *learning to know*, *learning to do*, *learning to live together and learning to be*. UNESCO also has a category I institute specialised in lifelong learning (UNESCO Institute of Lifelong Learning, UIL), in Hamburg, Germany.

In countries of Central Asia, understanding of and appreciation for lifelong learning has expanded significantly since the Tashkent Regional Conference on EFA-LLL³ in 2003, the first conference of its type in the region. The *lifelong learning initiative*, which gained special urgency in this region following this conference, has helped to spread the application of lifelong learning in the region through the development of pilot projects in all participating countries. In addition, the initiative influenced an institutional expansion of life skills training, as well as the growth of a network focused on adult training.

However, despite efforts to strengthen opportunities for lifelong learning, there are still children who are out-of-school in Central Asia and in some countries the number is increasing. Disparity in access to quality education remains, and there is often a lack of political support and strong

³ For more information on the conference's Call to Action, please visit: <http://www.unesco.org/education/uie/pdf/country/Uzbekistan2.pdf>

frameworks to really achieve a culture of lifelong learning. In the context of a rapidly changing world and an increasingly knowledge-based economy, this is an important concern for Central Asian countries.

A changing world

Due to globalisation and our resulting connectedness, the changes we currently experience are omnidirectional and occurring at a pace faster than ever before. The implications of globalisation are perhaps even more acutely felt in the Asia-Pacific region, its rapid economic growth. Even in the face of a global economic downturn, economies of this region have been growing at an impressive rate. According to the ADB's *Key Indicators for Asia and the Pacific 2012*⁴, the region contributed about 36% of global GDP in 2011 while Europe, North America, and the rest of the world contributed 28%, 23%, and 14% respectively. Given that the Asia-Pacific region is home to two-thirds of the world's population, there is much room for this region to grow further still, dramatically changing the global economic outlook and the shape of development worldwide.

Indeed, the Asia-Pacific region has experienced significant shifts in its economic structure. Its once largely agriculture-based economies have undergone an intense process of industrialisation. Meanwhile, its high-income countries have evolved into post-industrial economies that are less reliant on industry and increasingly more dependent on the service sector. Simultaneously, the opening up of borders has also facilitated greater population flows between countries. In Central Asia, for example, labour migrants contribute significantly to the growing economies of two key receiving countries: Kazakhstan and Russia. International migrants in the region are also increasingly moving to new destination countries, including Brunei Darussalam, Malaysia and the Republic of Korea. Worldwide, internal migration has increased dramatically with an estimated fivefold increase in the number of people living in urban areas between 1950 and 2000. Demographic landscapes are also shifting, particularly in the Asia-Pacific. According to UN figures, 62% of the world's 15- to 24-year-olds are from this very region. A number of countries in the region are experiencing a youth bulge, where people between the ages of 15-24 make up the largest demographic segment of the population. In contrast to this, many other countries are experiencing rapidly ageing populations.

It should also be mentioned that these changes are occurring in the context of intensifying climate change, which is significantly altering the natural environments in which we live. A 2012 report from the Centre for Research on the Epidemiology of Disasters (CRED) clearly shows that the number of disasters is on the rise since the beginning of 2000 (Figure 1). The report shows that in 2011, 78% of "geophysical disasters" (e.g. earthquakes and volcano eruptions) occurred in Asia, claiming 92% of the total number of victims worldwide.

⁴ ADB (2012). *Key Indicators for Asia and the Pacific 2012*.
<http://www.adb.org/sites/default/files/pub/2012/ki2012.pdf> accessed on 28 February 2013

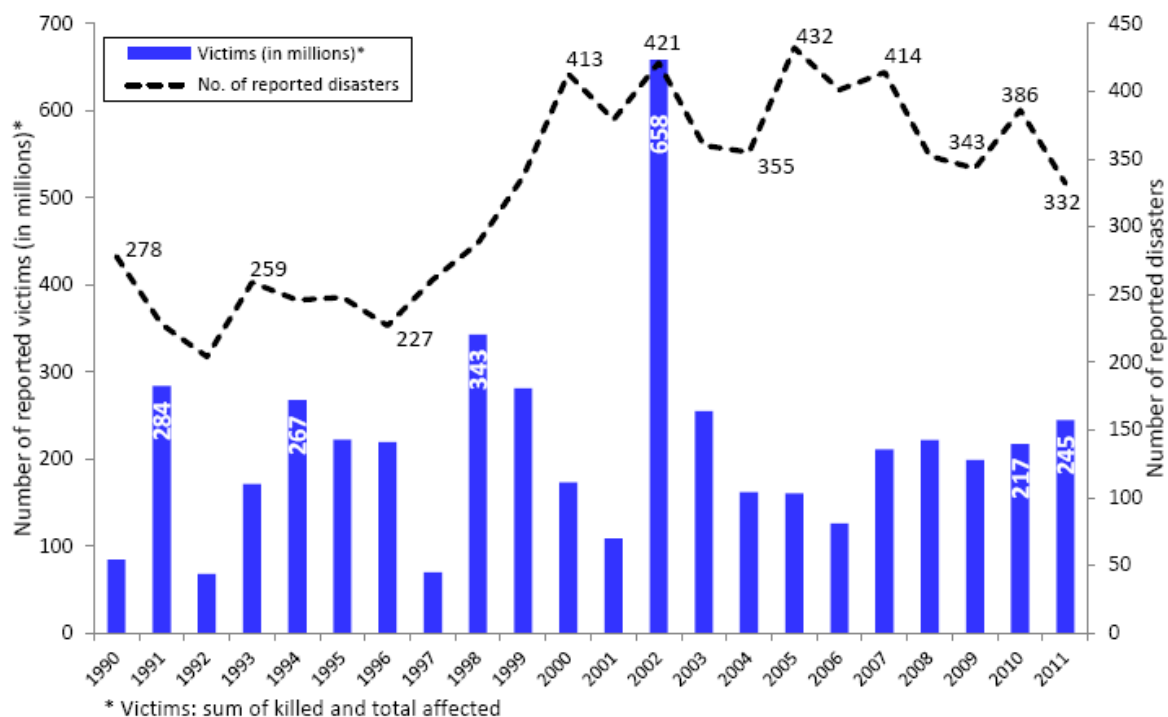


Figure 1 Trends of incidence of natural disasters and victims Source: Guha-Sapir et al (2012) p.3

5

Because of these significant changes, particularly in the Asia-Pacific region, it is critical, perhaps now more than ever, that all people, regardless of age, location or stage of life, develop the skills to adapt to change. In order for societies to cope with the great number of changes that will continue to shape our communities and shape our lives as individuals, new approaches to lifelong learning must be incorporated into education systems and into government policy-making. In this regard, ICT in Education will play a fundamental role.

ICT in education

Information and communication technologies have by now spread to even the most isolated and remote areas of the world. Between 2006 and 2008, mobile phone subscriptions rose by over 70% in low-income countries alone, and internet access increased by a sizeable 10%⁶. The number of websites grew astronomically as well, from virtually none in 1995, to over 200 million just 15 years later (OECD, 2010)⁷.

Advancements in ICT have expanded access opportunities to quality education for all, not only in terms of reaching the unreached but also for enhancing lifelong and lifewide learning. These developments are challenging the limitations of conventional learning in terms of the space and time within which learning occurs. While traditionally confined to educational buildings,

⁵ Guha-Sapir, D., Vos, F., Below, R., with Ponsérre, S. (2012). *Annual Disaster Statistical Review 2011: The numbers and trends*. Brussels: CRED. http://reliefweb.int/sites/reliefweb.int/files/resources/2012.07.05.ADSR_2011.pdf accessed on 28 February 2013.

⁶ United Nations

⁷ OECD (2010). *Trends Shaping Education 2010*. OECD: Paris.

technology has broken down barriers, and opened up countless possibilities regarding where and how learning can take place.

ICTs have led to the development of new pedagogical approaches that employ technology. For example, ICTs provide increasingly diverse delivery modes of and pathways to learning through open source education, increased access to knowledge resources through mobile learning, use of social networking in education, and peer learning. ICTs also open up new opportunities for education to occur in both non-formal and informal settings through vocational training centres, through in-company training and through extracurricular learning centres. ICTs provide opportunities for new types of learning modalities to cater to the great diversity of learners and in a great diversity of circumstances, including part-time and modular courses.

Countries in Central Asia are also paving the way forward with stronger incorporation of ICT in Education in government policy plans. The Government of Kazakhstan is committing itself to pilot e-learning programmes in 537 schools in the 2013 academic year with the ambitious goal of involving 90% of schools by 2020. Mongolia has also made strong efforts to develop ICT for lifelong learning through the introduction of policies, infrastructure, projects and resources, and relevant capability building for both students and teachers.

Summary of Country Presentations

Republic of Kazakhstan

Quick Facts

Population (millions)*	16	Rural Population (%)	42
GDP per capita (PPP US\$)	12,174	Adult HIV Prevalence (%)	0.1
Primary Gross Enrolment (%)	111	Life Expectancy (years)	68
Primary Net Enrolment (%)	89	Adult Literacy (%)	99.7
Out of School Children (%)	1	HDI**	0.745
Public Spending on Education as % of GDP	3.1	EDI***	0.994

Source: UIS (Glossary) *UNPD **UNDP ***GMR

Education is one of the priorities of the long-term strategy titled “Kazakhstan-2030”. Integration of ICT in education is considered to be one of the main mechanisms of implementation of the national educational strategy “The Law on Education”. The National Programme for the Development of Education for 2011-2020, approved in October 2010 by a Decree of the President, envisages the use of ICT in the educational process as a means to promote student-oriented approaches, openness and widening access to education. A separate section of the Programme includes measures to be taken and indicators to be achieved in the introduction of eLearning.

The national standard “Organisation of education with the use of distance educational technologies: Conceptual issues”, which provides the core regulatory framework for distance education, was approved by the Ministry of Education and Science of the Republic of Kazakhstan in June 2009. In the framework, requirements for higher education institutions offering distance education have been specified in terms of access to information and educational resources by student, use of distance education technologies, website and courseware, etc. Thus, from legal

and regulatory points of view, the prerequisites for the development of educational resources in the country can be considered as favourable.

Kazakhstan's E-learning system has been developed for all levels of education, with particular focus on the development of digital educational resources (DER) as its integral component. In 2011, the main developer, the "National Centre of Informatisation" (known as "JSC"), developed DER on the "History of Kazakhstan" for grades 5-11 in Kazakh and Russian languages. The results of pilot testing in Astana, Almaty and Karaganda schools proved that the DER can be used at different stages of a lesson: explanation of new material, during final review, revision and independent work. The DERs were perceived to make the lessons more complete, engaging even those students who were not interested in the subject. The tests showed the improvement of students' attitude towards learning, with 83.6% stating that the learning process had become more interesting and 84.8% stating that their attitude towards the subjects had changed positively. The "National Centre of Informatisation" currently has a collection of 5059 DER, including DER for Mathematics (grades 1-6), Algebra, Geometry and Physics (grades 7-11), Chemistry (grades 8-11), and Kazakh language (grades 1-11).

As of 2012, the total number of DER produced collaboratively by the "National Centre of Informatisation" and the consortium for technical and professional education amounts to 1,974. The number is made up by 210 (Kazakh) and 210 (Russian) for Basics of Nutrition; 71 (Kazakh) and 71 (Russian) for Marketing and Commerce; 135 (Kazakh) and 135 (Russian) for Fridges and Compressor Machines and Equipment; 53 (Kazakh) and 53 (Russian) for Technology and Organization of Production; 22 (Kazakh) and 22 (Russian) for Management by Branches and Applications; 32 (Kazakh) and 22 (Russian) for Accounting and Audit; 414 (Kazakh) and 414 (Russian) for Technical Maintenance, Repairs and Operation of Automobile Transport; and 50 (Kazakh) and 50 (Russian) for Computer Engineering and Software.

Furthermore, the Centre has developed a number of automated systems, namely:

- A School Management System (SMS) to facilitate the automation of certain school management processes. It has been designed for users (director, deputy directors, teachers, supervisors, students, parents, librarians, medicines, SMS operators) and contains information on school history, statistics, accounts, library, nutrition, communication, etc.
- A Learning Management System (LMS), which includes modules on various learning programmes, digital educational resources, individual didactics studies, individual studies, announcements, and Internet resources.
- A Testing Management System (TMS) to monitor the progress, interim and final achievements of students, thus assisting in the preparation of students for the intermediate national examination and Unified National Testing.
- An Electronic Methodological System (EMS), which includes Electronic Psychological and Monitoring System for Development of an Individual (PsMS), Management of Professional Orientation System (PrOS) and System of Social Collaboration (MSCC).

To train users on using the systems, the Centre collaborates with the Joint-Stock Company OLEU in the conduct of user-training workshops: "Training on Using Technologies of the System of Electronic Learning (e-Learning)" and "Training on Using Technologies of Digital Educational Sources (DES)".

Kyrgyz Republic

Quick Facts

Population (millions)*	5.3	Rural Population (%)	63
GDP per capita (PPP US\$)	2,273	Adult HIV Prevalence (%)	0.3
Primary Gross Enrolment (%)	100	Life Expectancy (years)	69
Primary Net Enrolment (%)	87	Adult Literacy (%)	99.2
Out of School Children (%)	5	HDI**	0.615
Public Spending on Education as % of GDP	6.2	EDI***	0.97

Source: UIS (Glossary) *UNPD **UNDP ***GMR

The key priorities of the reforms in the Kyrgyz Republic's educational system are quality, efficiency, and accessibility. The current reforms cover all levels of education and envisage the application of the unique methodology of the arrangements for the content of education (result-oriented education).

The educational strategy of the Kyrgyz Republic was developed as a national doctrine for the current period until 2025, draft concept paper and draft strategy for education development till 2020. The main objective of the draft Strategy for Education Development of the Kyrgyz Republic for 2012-2020 is to provide conditions for the sustainable development of the education system through the efficient use of internal and external resources towards improving the quality of educational services. Financing of the educational system has increased from 9616.6 million *soms* to 18231.3 million *soms*. A distinctive feature of the reform is its transition to a 'per capita financing pattern', in which money "follows" the student – this enables autonomy of schools in terms of resource management, reinvestment of resources saved, improving the quality of education by enhancing the motivation of students, etc. Another characteristic feature is the reduction of the aggregate training load for students.

To develop an E-learning environment, 100 innovative schools were equipped with interactive whiteboards and computer classes to pilot new curricula. In-service training was organised for teachers of these schools to help them master new teaching technologies.

Further, a feasibility study was conducted of a programme aimed at providing a laptop/netbook to every primary school pupil. As a result, the project "Laptop/netbook for pupils" will be implemented through the mechanism of guaranteed purchase (deferred credit for 2-3 years) targeting parents of approximately 65% primary school students.

In terms of content, the Kyrgyz Academy of Education collaborated with leading experts in developing and publishing a series of electronic textbooks for students and teachers.

Most of the 50++ higher education institutions (HEIs) in the Kyrgyz Republic have websites, digital libraries and collections of electronic educational resources. The number of computers in HEIs increased from 1,200 to 21,800 between the years 1996 - 2012, which improved the ratio of the number of students per one computer significantly, from 65 to 12 students per computer. (During the same period the number of students increased from 77,800 to 262,000). In addition, the number of students mastering ICT-related professions increased from 2,600 to 21,710 in the same period.

To ensure the high quality of distance education, the Board of the Ministry of Education and Science approved the decision to refuse issuing licenses for running extramural courses to the

higher education institutions of the Republic. Requirements to distance education were approved through the Resolution of the Government of the Kyrgyz Republic No. 429 of June 19, 2012. Despite this, the main challenges in the implementation of distance learning remain as follows:

- Lack of a regulatory framework that would govern and control distance education
- Scarce funding of public higher education institutions
- Digital divide: unequal access to ICT is aggravated by the lack of community ICT centres
- Issues related to author rights
- Necessity to organise re-training and advanced training of teachers

Mongolia

Quick Facts

Population (millions)*	2.7	Rural Population (%)	43
GDP per capita (PPP US\$)	4,036	Adult HIV Prevalence (%)	0.1
Primary Gross Enrolment (%)	100	Life Expectancy (years)	68
Primary Net Enrolment (%)	95	Adult Literacy (%)	97.5
Out of School Children (%)	1	HDI**	0.653
Public Spending on Education as % of GDP	5.4	EDI***	0.971

Source: UIS (Glossary) *UNPD **UNDP ***GMR

Policy documents governing ICT in Education in Mongolia, such as the State Great Hural of Mongolia Resolution No 21 “The ICT Development Vision of Mongolia 2010” (2000), “The ICT Vision 2010 in Education Sector of Mongolia” (2000), “National Programme on Distance Education” (2002), “E-Mongolia National Programme” (2005), “The ICT Vision 2015 in Education Sector of Mongolia” (2006), the Government Programme “One Laptop per Child” (2008), etc. highlight the priority areas of ICT in education, namely: (i) supply of ICT equipment, (ii) improvement of Internet connection, (iii) supply of specialists, (iv) strengthening of content, methodology and teaching materials related to the informatics. Specific measures to introduce ICT in the education sector were reflected in the “Major Directions on Introduction of ICT in Primary and Secondary Education up to 2015” and the “Education Sector Master Plan (2006-2015)”. The measures included improving education access, quality, equity and competitiveness by linking educational and training institutions at all levels to high-speed internet, and developing e-learning and distance education opportunities. Recently, a policy for the ICT in Education sector for 2012-2016 was approved. It outlines the general framework of ICT policy objectives, mid-term strategies, actions, and expected results.

Mongolia’s ICT infrastructure currently consists of a 13,000 kilometre optic cable network, servicing all cities, *aimags* (provinces) and 151 *soums* (districts). Rural *soum* residents have access to mobile phones and wireless internet, and the number of households with computers is rapidly increasing. However, due to unstable electricity supply, ICT infrastructure varies among cities and rural areas.

At present, student to computer ratio in general secondary schools is 16.4 students/computer and 11.9 in TVET schools. One third of all computers (11,470 computers) used in general secondary schools and two thirds of secondary schools (489 schools) are connected to the internet. A video conferencing network connecting education centres and local administrative institutions has been established, coupled with the launch of an information portal site for teachers. Further, private-owned entities have widened the variety and scope of services offered to schools in response to increasing ICT demands.

Although the computer supply in both urban and rural schools is increasing, most of them are for limited use only due to technical specifications and availability of spare parts. Although most schools have printers, copy machines, scanners, video cameras, digital cameras, LCD projectors and screens, their number is very limited. While it is becoming more and more common for basic education schools in large urban areas to establish an internal network system and develop their own websites, development of such systems is quite weak in rural schools due to the limited availability of necessary professional support and services in rural areas. Therefore, it is necessary to develop a consolidated policy and coordination to connect schools to a network, and to provide them with computer software, spare parts, and the required services.

With the support of MCS Electronics Company in 2008, the E-management system "E-school 2.0" was tested in School №1 and awarded an author right certificate of "E-school 1.0" from the Intellectual Property Organisation in 2010. The "Information System of Education Management" (Open EMIS) developed by UNESCO was tested jointly by the Ministry of Education, Culture and Science (MECS) and UNESCO experts in November 2009. The software database was installed in the MECS server to test the access from the City education organisation and educational and cultural organisation of Tuv Aimag. In the summer of 2010, testing involved 18,000 trainees, 130 educational organisations, 1,668 teachers and 736 staff.

The National Centre for Non-formal Education and Distance Learning connected 17 province centres by using ISDN technology in 2003. As much as 21 provinces and one district were connected to it through cable network. In-service teacher training mainly used the distance learning approach through the use of the video conferencing system established at each *aimag* (Province) Education and Culture Department (ECD). Moreover, Aimag ECDs established the "Education TV" channels or studio at their Departments to broadcast all educational, scientific, discovery, news, educational Olympiads, and the training approaches for teachers and life skills programmes for parents.

In 2009, MECS conducted training programmes using the distance learning approach by broadcasting TV lessons throughout the country. Educators broadcasted TV lessons (180 hours) on core subjects distributed and uploaded through the Khicheel website (www.khicheel.mn). The Government commissioned the duplication of lessons on CDs and DVDs for distribution to schools that are not connected to the central power supply or have limited electricity supply. In line with transition to the 12-year school system, electronic versions of primary education textbooks have been uploaded to the MECS website (www.meds.gov.mn) since School Year 2009-2010. Further, with an overall aim to improve the training/learning environment of English language, 500 DVD players were distributed (with electronic textbooks) to rural schools. To make this initiative sustainable, the Government initiated the development of a historical DVD "Chinggis Khaan for a thousand of years" for distribution at schools.

MECS, in collaboration with the MobiCom Corporation, implemented the "E-training" project in 19 schools during School Year 2010-2011. The project was aimed at (i) introducing the EMIS system in schools; (ii) establishing a "teacher cabinet" with high-speed internet connection; (iii) creating a school website and implementing distance learning training; (iv) creating an electronic data base (lessons, exams, library, teacher and student information).

In addition, MECS organised four regional advanced training workshops on ICT for 1,872 primary teachers (23.1% of the total number of teachers) and training managers in 2009. An in-service training was organised by MECS, in collaboration with the Ministry of Education of Korea, for more than 200 trainees including ICT teachers, ECD methodologists and representatives from the Education Institute and the Mongolian State University of Education. The participants were trained

in a methodology for applying ICT in everyday teaching. When the participants returned to their respective institutions, they organised 'echo-training workshops' for all the secondary school teachers and methodologists.

To improve the nation's informatics manpower, the following informatics curriculums for secondary school were developed: Informatics Curriculum (1991); MNS-5001-498: Informatics Standard (1998); and the Informatics Education Standard for Primary and Secondary Education (2004). The first informatics curriculum was integrated in the secondary school programme in 1991. It covered the basic concepts of informatics, algorithms and programming, word processing, and spreadsheets. Since 2009, 43 educational institutions including higher education institutions and colleges have been offering BA or higher degree programmes in ICT and computer studies. There are specialised classes on "Computer Application", "Communication Technology and Information System Foundations", and "Computer Software". Since October 2007, an exam for communication technology engineers has been introduced according to the standard "Information, Communication and Technology Engineering".

International organisations and development partners have provided invaluable support in building local capacity towards improving the policy foundation for the integration of ICT in the education sector and the development of a corresponding long-term strategy. Since the Government approved the national programme titled "Electronic Mongolia", international partners, such as UNESCO, the ADB, and the World Bank intensified technical assistance. The ICT Authority (ICTA), a national agency in charge of information and communication technology issues, was established. A number of programmes aimed at connecting schools to the Internet, improving computer software, and teachers' ICT skills have also been completed. Currently, private entities are developing and becoming more skilled in this sector. Teachers at all levels of education are requested to use ICT in preparing their lesson materials, delivering information, and solving math problems. However, Mongolia is still lacking a professional department that can facilitate the administration and coordination at every stage of strategy development for the introduction of ICT in the education sector.

Republic of Tajikistan

Quick Facts

Population (millions)*	6.8	Rural Population (%)	74
GDP per capita (PPP US\$)	2,163	Adult HIV Prevalence (%)	0.2
Primary Gross Enrolment (%)	102	Life Expectancy (years)	67
Primary Net Enrolment (%)	97	Adult Literacy (%)	99.7
Out of School Children (%)	2	HDI**	0.6
Public Spending on Education as % of GDP	4	EDI***	0.97

Source: UIS (Glossary) *UNPD **UNDP ***GMR

The concept of education management information system (EMIS) was approved by the Government of Tajikistan on November 2, 2007, with the goal of building the capacity at the Ministry of Education and the district education departments to independently maintain and develop relevant information systems. This included: (i) automation of existing statistical reporting, (ii) development of new forms/entries of statistical data, (iii) development of an integrated information management system, and (iv) development of an information system for the management of educational institutions.

To achieve this goal, it was necessary to enhance employee computer literacy skills among the concerned offices and to teach educators to deal with digital information. In view of this, new questionnaires were developed to collect the full scope of data needed for the analysis of the education system (modules: "teacher", "library", "student", "finance", "material base", etc.). New software was then developed and introduced to enable automated collection, transmission, and processing of information on all modules ("Maktab-2"). Computers were purchased and installed at the Ministry of Education, at district and regional divisions, and at departments of education. A local network was established at the Ministry of Education and in the offices and departments of education. A system for exchange of electronic information between the Ministry of Education and departments of education was created.

The development and implementation of the "Maktab-2" involved the development and approval of the questionnaire; development of the software package for data input; installation of the software at the regional and district departments; data collection and processing; development of the software for report generation; installation of the report generator in regional and district departments; and related personnel training at each stage.

The following activities related to the development of the EMIS "School Finances" and EMIS "Maktab-2" have been completed: the software for data entry and report generator; guidelines for using the software; methodology and regulating documents for automated data collection; and guidelines for completing the questionnaires.

The following activities related to the development of the "Textbook Loan" information system have likewise been completed: developed a methodology for automated data logging and the software of the information system for the level of the Ministry of Education and education departments; developed and disseminated guidelines for the use of the software and the methodology of coding books and compliance with automated data recording; software installed at the Ministry of Education; staff training on the use of the system; questionnaire developed; the FTP server set up; software for the FTP server and guidelines for the use of FTP server developed; mail domain Maorif.tj and open e-mail addresses on Maorif.tj established; Internet in the departments of education installed.

Training of the Ministry staff and personnel of district education department were organised on the use of "Maktab-2" and "School Finances" to include filling in and monitoring of all forms of questionnaires, completing the questionnaire SMN-1 (Construction work in schools), as well as use of the FTP server and e-mail.

The unified database of the Ministry of Education of the Republic of Tajikistan will also include information systems for "Kindergarten", "School", "Vocational-Technical Schools", "Secondary Vocational Schools", and "Higher Educational Institutions" and contain information about budget, enrolment and other statistical data.

Turkmenistan

Quick Facts

Population (millions)*	5.042	Rural Population (%)	51.3
GDP per capita (PPP US\$)	9,420	Adult HIV Prevalence (%)	---
Primary Gross Enrolment (%)	---	Life Expectancy (years)	65
Primary Net Enrolment (%)	---	Adult Literacy (%)	99.6
Out of School Children (%)	---	HDI**	0.743
Public Spending on Education as % of GDP	---	EDI***	---

Source: UIS (Glossary) *UNPD **UNDP ***GMR

The reform of the educational system launched in Turkmenistan in 2007 covers the improvement of the legal framework, modernisation of the structure and content of the educational system, strengthening of the infrastructure of education, introduction of innovative ICTs and improvement of teacher training. Note that the national education system is in transition to a 12-year general education.

National priorities on ICT in education are declared in the President Decree "On improvement of the education system of Turkmenistan", the Ordinance "On improvement of the educational and training institutions" adopted in 2007, and the Law of Turkmenistan "On Education" adopted in 2009. The state programme for the development of education for 2012-2016 foresees the following: (i) development of an education management information system, (ii) upgrade of hardware, (iii) increase in the number of schools connected to the Internet, (iv) establishment of the National Centre for Information Technology and Innovation under the Ministry of Education, (v) design of an Internet portal of the Ministry of Education and websites of educational institutions, (vi) design and development of new digital lessons, electronic materials and E-textbooks, (vii) introduction of electronic diaries and timetables, (viii) E-services for parents to inform them about the educational achievements of students, etc.

There are currently 878 preschool institutions, 1,761 secondary schools, 127 primary and 32 secondary vocational and 23 higher education institutions. The plan is to increase the number of pre-school institutions by 428 and the number of secondary schools by 328 by 2020. All preschools and primary, secondary and higher educational institutions of Turkmenistan are equipped with modern computers, interactive whiteboards, and multimedia devices. Classrooms, laboratories and libraries are equipped with ICT. Furthermore, since the academic year 2011/2012, first grade pupils have been provided with free notebooks, in accordance with the Decree of the President. Primary and secondary vocational schools have special computer classes. Computer Science is included in the curriculum of primary grades as extracurricular courses and from the sixth grade as a compulsory subject.

Each university has special rooms and laboratories that are equipped with modern computers and other multimedia technologies. Universities are connected to the virtual network, making digital libraries and digital lectures of leading professors accessible to all network members. Integration of innovative ICT practices in vocational education is a priority in the modernisation process of the Turkmenistan educational system.

Secondary school students actively participate in national Olympiads in science and ICT, organised annually by the Ministry of Education, as well as in international Olympiads held in Ashgabat in 2001, 2004, 2008 and in 2012. More than 200 students, scholars of modern computer technology from dozens of countries, including Germany, Russia, Turkey, France, UK, Poland, Brazil, Malaysia,

Bulgaria, Kazakhstan, Kyrgyzstan, etc. took part in the Olympiad. Students of secondary and higher professional education institutions also participate in international competitions. In 2012, Turkmen pupils participated in 22 international competitions and were awarded 123 medals, while higher school students participated in seven international competitions and won 32 prizes.

Training courses for teachers have been organised to enhance their skills in computer literacy, development of electronic educational materials, and use of ICT and multimedia technologies in education. The National Institute of Education of Turkmenistan organises relevant training courses for management staff to improve education management.

The website of the Turkmen Research Educational Network Association (TuRENA - <http://www.science.gov.tm/en/projects/courses/>) contains a series of distance education courses.

Uzbekistan

Quick Facts

Population (millions)*	30.	Rural Population (%)	49
GDP per capita (PPP US\$)	2,887	Adult HIV Prevalence (%)	0.1
Primary Gross Enrolment (%)	n/a	Life Expectancy (years)	68
Primary Net Enrolment (%)	n/a	Adult Literacy (%)	99.3
Out of School Children (%)	0	HDI**	0.641
Public Spending on Education as % of GDP	---	EDI***	0.97

Sources:

- * population based on <http://ru.wikipedia.org/wiki/%D0%A3%D0%B7%D0%B1%D0%B5%D0%BA%D0%B8%D1%81%D1%82%D0%B0%D0%BD>
- ** In accordance with the Law of the Republic of Uzbekistan, "On Education" 12-year education is compulsory and all school-age children attend schools, except for those who cannot do that due to health reasons, but all those study at home and are visited by teachers.
- *** HDI and EDI figures from [http://www.press-service.uz/ru/news/show/vistupleniya/address by h.e. mr. islam karimov presid/](http://www.press-service.uz/ru/news/show/vistupleniya/address%20by%20h.e.%20mr.%20islam%20karimov%20presid/)

Almost 10-12% of the national GDP is allocated to education, whereas some 50% to the social sector. At present, there are more than 4,468,000 students and over 410,000 educators in 9,765 general education institutions. There are 143 academic lyceums and 1,406 professional colleges with more than 1,717,000 students and more than 115,000 teachers and educators are engaged in teaching. There are 58 higher educational institutions for more than 280,000 students that are taught by 230,000 teachers.

Information resource centres, teacher distance learning centres and institutes, and the majority of schools, academic lyceums and vocational colleges have been equipped with computers through the State Programme. By the end of 2012, 87% general schools were equipped with computers and 2,236 computer rooms had been established (41,500 PCs) in 1,549 academic lyceums and colleges. Before 2005, "Informatics" as a discipline was a part of the curriculum of grade 8 and 9. In 2005, following the Government's decision, "Informatics" is taught since grade 5, thus national educational standards, curricula, programmes and new textbooks were developed for grade 5-9. In the school year of 2011-2012, the subject was introduced at grade 2 in some schools.

All higher education institutions are connected to the Internet and have websites. Connection speed is 1 to 6 Mbps. Information centres created within these institutions are equipped with appropriate tools for videoconferencing. To further improve ICT capacity among higher education institutions, the Ministry for Higher Education and Secondary Specialised Education, in cooperation with the State Committee for Communication, Informatisation and Telecommunication Technologies, implemented a project called "Establishing National Network of Electronic Education" that connected all higher education institutions and their branches into a corporate network. The network is connected to the national high-speed fibre cable and allows high-resolution videoconferencing, direct transmission of data, exchange of information and educational resources, and application of distance learning methods.

To create appropriate conditions to satisfy student demand and to create youth-related educational resources, target indicators and schedules of connecting to the "ZiyoNet" network were defined through various relevant legislative acts of the Government. Connection of the general education schools to the "ZiyoNet" network in cities may be conducted based on ADSL technology, whereas wireless technologies (CDMA-connection) were an option for those in mountainous, desert and distant regions. The costs of connection to the "ZiyoNet" network and Internet access are completely financed by state budget. The "ZiyoNet" web portal is fully operational and is regularly enriched with free-to-access resources, including electronic textbooks, methodological recommendations, normative documents, educational standards, curricula, lecture notes, tests, software, audio and video materials, educational films, etc.

By the academic year of 2012-2013, 119 electronic educational resources (e-manuals, educational films, virtual labs, testing software, etc.) had been developed in the system of the Ministry of Public Education. These are available free-of-charge on the Ministry's web-portal. Furthermore, in collaboration with the UNESCO Tashkent Office, the Open EMIS was localised and published by UNESCO.

The average level of informatisation among institutions of education (including personnel training institutions) in Uzbekistan lags behind those of the developed countries, but some institutions offer services of appropriate level. To further develop ICT skills among teachers, professional development courses have been organized by the Ministry in 2,500 schools for 41,600 teachers and educators. Retraining is being monitored on the web-site www.akt.uzedu.uz. In addition, in collaboration with the UNESCO Tashkent Office, training workshops on the integration of ICTs into education were conducted for almost 350 teachers from all regions of the country. Training on the use of Web 2.0 technologies was likewise organised in cooperation with UNESCO Tashkent in October 2012 for methodologists and specialists of the Republican Education Centre and regional departments of public education. Annually, approximately 16,000 teachers from secondary specialised and professional schools are re-trained at 45 training institutions. Management personnel, on the other hand, undergo professional development at the Institute for Training and Re-Training of Personnel of Secondary Specialised and Professional Education.

In 2006, the Centre of Multimedia Software Development was established under the Ministry of National Education to: (i) develop electronic applications; (ii) adapt, localise, and publish available educational resources in seven languages used for teaching in Uzbekistan (including translation from foreign languages); (iii) research, analyse, and monitor efficiency of IT trainings and educational materials; (iv) support the educational web portal of the Ministry. Recently, the Centre for Integration of Electronic Education into Educational Institutions was established under the auspices of the Ministry of Higher and Secondary Specialised Education to implement projects in higher education institutions related to the organisation of educational processes and conducting researches by using ICTs.

In accordance with the Law “On Informatisation”, the Ministry carries out various activities to integrate ICT into management and educational processes. Activities are likewise underway towards integrating distant learning technologies into Uzbekistan’s educational processes.

Emerging trends and common challenges

Findings from country presentations and discussions during the Symposium indicate that the Central Asian countries face a number of emerging trends and challenges in promoting ICT-supported lifelong learning.

1. Increasing recognition of the importance of educational information systems

ICT is increasingly being recognised in the region as an important tool for better management and teaching/learning. There were diverse examples of ICT-based management systems, such as integrated databases at the school-, local- and central levels, as well as the use of ICT to improve communication with parents and other stakeholders. The National Centre of Informatization of **Kazakhstan** has developed a School Management System (SMS) that aims to make school management automated for multiple levels of users, ranging from directors to teachers to students to medical personnel. **Mongolia**’s “E-School 2.0” is among the well-known systems in Central Asian countries, developed in 2009 in collaboration with the Ministry of Education, Culture and Science (MECS) and UNESCO. The E-School 2.0 adapted the UNESCO Open EMIS architecture. Work is underway in **Uzbekistan** towards adapting the Open EMIS architecture for the new system for school administration being piloted. In **Tajikistan**, since the concept of EMIS was approved by the Government in 2007, “School Finances” and “Maktab-2” have been fully developed and tested and thus the Ministry of Education and various departments of education and district education authorities have gained enhanced connectivity. The trend of increasing recognition of the use of ICT for improving education information management was also seen in **Turkmenistan** where the State Programme for Education Development 2012-2016 foresee and prioritize the development of an EMIS.

It was noted that an effective EMIS requires two distinctive conditions. First, a unified design of the EMIS architecture is essential to realise an effective data collecting system. In other words, an EMIS should be developed in a way that facilitates horizontal data collection so that data from one school level can readily communicate with that from another. The design should also enable vertical data collection in which school-level data can be entered into a district or national system without requiring the modification of the data format. Secondly, connectivity and network infrastructure among institutions need to be enhanced and well-maintained in order to fully automate the data collection and avoid errors caused by manual data entries.

2. Needs for wider connectivity and infrastructure

As pointed out earlier, strong connectivity was considered throughout the Symposium discourses as a pre-condition for the successful integration of ICT into education systems. Although there is a precaution that transforming education systems towards a lifelong learning society takes more than equipping the country with computers and networks, it is undeniable that a certain level of ICT infrastructure is needed to jumpstart reforms in the education systems to prepare for the digitally connected world. As shown in Figure 1, the status of internet users in Central Asian countries (21.71 per 100 inhabitants) is lower than the world average (32.77 per 100 inhabitants). On the contrary, the penetration of mobile phones

in most of the Central Asian countries is comparable to or even exceeding the world average, showing the potential for improved connectivity.

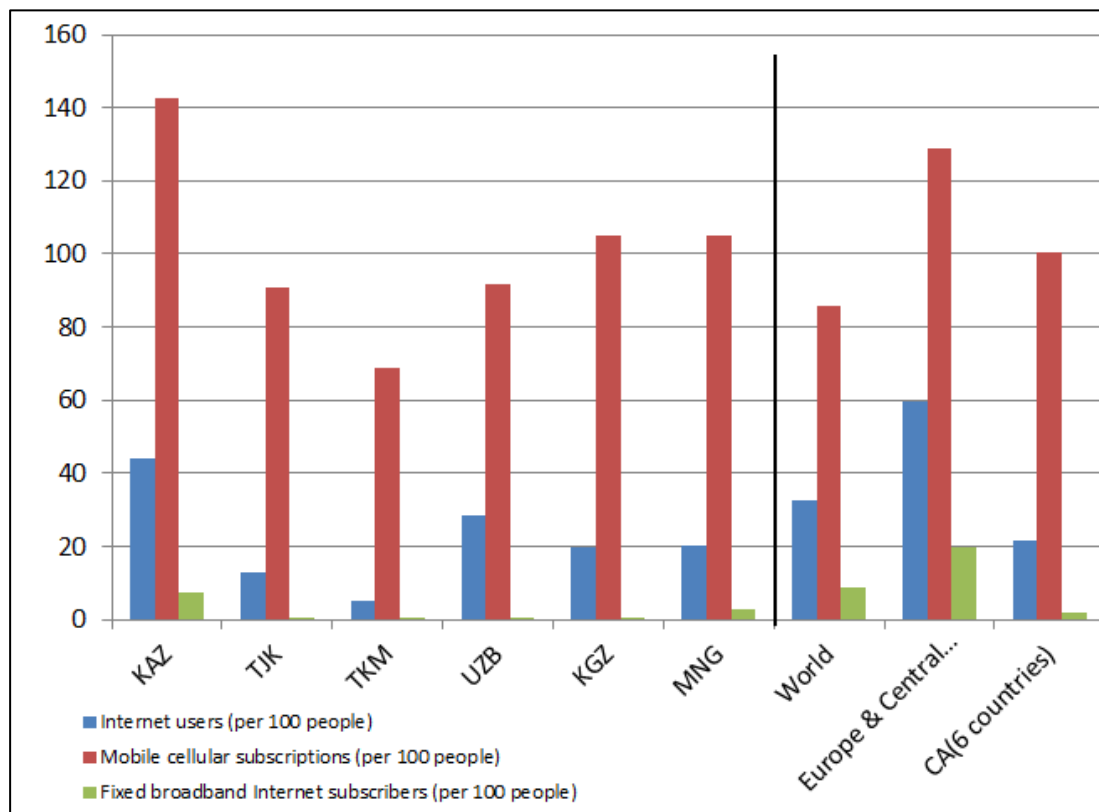


Figure 2 Status of Mobile & Internet Users (ITU, 2011)

In **Mongolia**, the “Education Sector Master Plan 2006-2015” aims to improve education access, quality, equity and competitiveness. Special measures were taken including linking educational institutions at all levels to high-speed Internet and the Government programme “One Laptop Per Child”. As a result of such measures, two thirds of all secondary schools in the country, for example, have become connected to the Internet through the extensive optic cable network (which connects 151 *soums* in total). In **Uzbekistan** and **Turkmenistan**, the Governments prioritised the improvement of connectivity for higher education institutions, allowing video conferencing courses and digital lectures for network subscribers. Inter-ministerial coordination and private-public partnerships were also mentioned as keys in improving connectivity and infrastructure of schools and education systems.

3. Lack of systematic and stable funding mechanisms

Most country cases stressed the need for more systematic funding sources and innovative mechanisms to achieve ICT-supported lifelong learning at various levels. **Kyrgyzstan**, supported by a considerable increase in the education budget, launched the guaranteed purchase scheme to support the “laptop for pupils” project, providing deferred credit to parents for 2-3 years. Despite this, it was also noted that funding remains scarce for public higher education institutions across the country. Although it was asserted that strengthening public-private partnerships would contribute to securing funding, it has to be emphasised that a comprehensive education plan with a clear and shared vision and relevant budget should be developed to support continuous ICT development and to prevent piecemeal investments.

4. Quantity and quality assurance for e-content

Although most of the countries committed themselves to creating knowledge portals to share e-teaching materials, educational videos, on-line lectures (e.g. **Kazakhstan's** Learning Management System, **Uzbekistan's** Ziyonet, **Kyrgyz** Academy of Education), the need for access to quality digital contents persist. There is still limited e-learning/distance education among the Central Asian countries due to, amongst others: issues of authorization of content (who should authorize and how), lack of motivation among teachers/professors, and an assessment method that still follow traditional "testing" methods for distance learning.

The ability to share contents among countries are still nascent given that the content has to be evaluated and approved by national standards, which in turn guide assessment mechanisms.. Diverse national languages also appear to be an obstacle for sharing quality contents. As a matter of fact, this linguistic challenge in creating and sharing quality educational resources is nothing unique to the region for official educational content is available in less than 1% of the more than 3,500 languages spoken in the Asia-Pacific region⁸ in 2009.

5. Lack of coherence between formal and non-formal/informal education channels

Absence of legal recognition of prior learning (e.g. non-formal and informal learning) emerged as a systematic problem in mainstreaming quality lifelong learning. One of the most important roles of policy in promoting lifelong learning is to systematically recognize learning through diverse channels of education, including non-formal and informal learning. According to e-ASEM's report⁹ (2012), recognition of prior learning (RPL) is seen as a common characteristic of countries that successfully mainstreamed e-Learning for lifelong learning, such as the Republic of Korea and Japan. Such policy has yet to be put in place in the Central Asian countries, as five out of six participating countries expressed the need for legislative and institutional arrangements to encourage lifelong learning.

6. Building up human resources for ICT-integrated education

It has been established that installing computers in schools does not guarantee changes in student learning. Likewise, participating countries agreed that more attention has to be given towards strengthening the soft power throughout various levels of human resources, including not only teachers but also school leaders, administrators, e-content developers and policy makers.

Although the country cases reported that an increasing number of training programmes have been developed and provided for teachers and officials to effectively use newly-deployed EMIS and e-Learning systems, it was also observed that training programmes for solid pedagogical use of ICT for teaching and learning are still lacking. Current teacher education programmes in the participating countries are reportedly still heavily focusing on productivity tools and computer literacy.

Integration of ICT into teaching/school management is not just about becoming technology literate; rather, it should be understood as "changing the culture of learning" that requires time and patience. Moving forward to a society that values lifelong learning entails new types of competencies such as self-directed learning and communication skills. To help students

⁸ Lewis, M. Paul (ed.) 2009. Table 7. Linguistic diversity of countries (from highest to lowest), Ethnologue, 16th Edition.

⁹ Lim, D., San, N., Munira, T. (2012). A Comprehensive Cross Analysis of e-Learning for Lifelong Learning in Nine Participating Countries of the e-ASEM Whitepaper Project.

develop such new competencies, teachers need to go beyond the conventional model of ICT use in the classroom where teachers mostly use slides and presentation tools to enhance traditional teacher-centred instruction. Teacher training should entail how to apply ICT in a pedagogical way, aiming to enrich student-centred approaches to teaching and learning and to help teachers accept the new role as facilitator rather than the traditional role of a knowledge transmitter.

In addition, the country cases revealed that there are emerging needs for capacity building for policy makers and government officials to enhance their competencies in developing a more comprehensive ICT in Education Master Plan that is clearly aligned with the national vision, and supplemented with a concrete strategic plan and matching budget.

Conclusions and Recommendations

The “Central Asia Symposium on ICT Education: Innovative ICT practices on lifelong learning” provided an important platform for countries facing similar development issues and challenges to share experiences and lessons learned, and exchange perspectives on the use of technologies in advancing the concept of lifelong learning.

All countries, except for Mongolia, gained independence only twenty years ago, and have consequently undergone a difficult transition period of state-building and consolidation in all aspects of development. Despite numerous initial difficulties, all countries have realized appreciable achievements, including those in various social sectors. The progress they were able to achieve and maintain, such as high levels of school enrolment, especially in basic education up to upper secondary level, is commendable.

However, several challenges remain. The quality of education, especially in terms of learning outcomes, is worrisome in the majority of Central Asian countries: test scores in international learning assessments have been very low compared to those of countries from other regions – and worse, scores continue to stagnate, or even decline. Stark disparities within countries, including in student performance, is another serious concern. This requires countries in this region to seriously reflect on learning enablers and come up with an appropriate mix of policy and governance measures to improve and reform education systems.

Policy makers and managers should bear in mind the rapid changes that the world is undergoing, and the impact they have (and will continue to have) on national education policy and practice, and society at large. Indeed, there are several changes that policymakers and managers in our education systems need to take into account when designing and implementing education reforms. For example, the way today’s learners are acquiring knowledge and skills is much different from what most of today’s teachers were taught to teach. Secondly, the fast pace of changes in society indicate that learners will often need to be taught and trained for jobs that do not yet exist. This requires learners to acquire not only solid foundation and specialized skills, but also other important skills, such as non-cognitive/transversal skills and competencies. This means that today’s learners are required to continue learning and updating their knowledge and enhancing their skills beyond school.

Therefore, the principle of lifelong and life-wide learning has become more relevant than ever before. Rapid technological changes have increased the likelihood that this principle, which was a dream of our past visionaries, can become a reality. ICTs, if used wisely and effectively, have the potential to establish a wider context of learning and improve the teaching and learning processes

in school as well as in learners' lives. It is against this backdrop that the Symposium was organized in Central Asia. In light of the findings of the previous sections of this report and with a view to further strengthen education and learning systems in the countries of this region, the following recommendations are suggested:

1. Develop a clear policy vision to support implementation

Aligning policy, planning, and budgeting within a consistent development framework will facilitate effective implementation and financing of the education policy and help mobilize all concerned stakeholders towards the goal of quality education for all. This means that any effective policy reform starts with a clear, coherent and sustained vision, which should be translated into costed action plans.

What is often observed in the education development process in several Central Asia countries is the lack of a coherent and budgeted education sector plan that is reflective of the country's needs and context, prepared on the basis of wide consultations, and in convergence with sector-wide as well as more overarching development planning frameworks. There are numerous initiatives and programmes on specific aspects of educational development, but these are often fragmented and coherence and continuity between them is lacking. Furthermore, when a new initiative is announced, it often supersedes existing programmes and resource allocations, resulting in a disruption of the overall consistency of educational development, which eventually widens the gap between policy and implementation.

ICT in Education policies will need to be better integrated into the overall education policy. It is important to clearly define how ICTs can extend education provision, strengthen teaching and learning processes, and promote lifelong learning beyond the current endeavour to invest more on ICT equipment and infrastructure in schools. The discussion on lifelong learning in education policy needs to be widened beyond its current confinement to adult and continuous learning and encompassing integrated learning – be it in school, family, or society – as well as the role of new technologies, including ICTs, to support the acquisition and continuous updating of foundation, specialized, and transversal skills throughout life.

2. Make the most of the benefits of partnerships

The successful implementation of education policies is best achieved when governments make efficient use of what all stakeholders can contribute towards achieving the common goal of "better learning for better life". Government leadership is key to successful partnerships – it is the government's primary responsibility to provide conducive legal, regulatory, and institutional frameworks that enable coordination between public institutions, efficient collaboration between government, private sector, civil society, and households and community at large, and effective cooperation among national, subnational, and school levels. Such regulatory frameworks to be established and facilitated by governments in the context of the use of ICTs for lifelong learning include: (1) clarifying the concept and institutional arrangements for a lifelong and life-wide learning society, (2) strengthening the linkages between government departments' policies related to ICT development and lifelong learning, (3) providing a policy framework and environment for genuine public-private partnerships based on the advantages of various stakeholders (including government officials, ICT experts, education practitioners and researchers), and (4) facilitating equivalency of learning between different pathways to education (e.g. recognition of prior learning, formal and non-formal/distance learning qualifications). In addition to regulatory frameworks, governments should allocate appropriate resources for an initial investment in ICTs for education and lifelong learning (including for ICT infrastructure and e-content).

Moreover, considering the increasing constraints of public finances and the comparative advantages that other stakeholders can bring in, governments should endeavour to encourage and facilitate the use and channelling of other actors' inputs towards the provision of quality education and learning.

3. Pay more attention to teachers in promoting ICT for lifelong learning

Strengthening the use of ICT in teaching and learning as well as in school management essentially requires "changing the teaching culture", a change that can be effectively implemented through teachers and school leaders. Most teachers and school leaders were not prepared by teacher education programmes for today's rapidly changing educational requirements. Changing the teaching culture will therefore require time and patience, and must start with a good understanding of policy.

More efforts must be made to strengthen the "soft power" in the education field (i.e. capacity building and ICT pedagogy integration). Therefore, governments must further recognize the critical importance of teachers as change agents in promoting ICT for lifelong learning. One concrete intervention would be to strengthen teacher training programmes by placing a more solid focus on pedagogy for ICT use, alongside with or even before providing ICT equipment to students and schools. In addition to teacher education and training, more efforts must be made to motivate educational leaders (i.e. school principals, local administrators) to support effective ICT use in schools. Training on ICT use must include not only information on how to 'teach technology', but also information on how teachers can support "behavioural" changes that aim to promote the acquisition of transversal skills, (sometimes referred to as 21st century skills) such as communication, collaborating skills, etc. Furthermore, the "student-centred approach" should be fully considered when designing and developing e-learning content.

4. Monitor performance and outcomes for evidence-based policy and implementation

Significant public investments demand a significant return in terms of educational, social, and economic benefits. Programs must be continuously monitored and measured for progress, difficulties and success throughout all stages of implementation and process. Results will help policy makers and managers refine policies and adjust programme implementation, including the introduction of necessary measures to overcome shortcomings in specific areas of policy implementation. Building and maintaining a robust EMIS is key to supporting improved education policy planning, management, and monitoring that will enhance governments' efforts to promote better learning throughout life.

Data relating to ICT use and lifelong learning are in general very weak in the countries of Central Asia. Research shows that countries with high-performing education systems tend to produce more data on education initiatives and use it more widely and effectively. Central Asian countries will have to make more serious effort to build, operate, and maintain strong databases on educational systems. Data can then be organized, analysed, and used to strengthen quality research on educational issues and for formulating evidence-based educational policies. This would likewise facilitate the process of transferring relevant lessons learned into policy change that enables better use of ICT for education and lifelong learning.



United Nations
Educational, Scientific and
Cultural Organization

••••• **UNESCO Bangkok**

••••• Asia and Pacific Regional Bureau for Education

••••• Mom Luang Pin Malakul Centenary Building
••••• 920 Sukhumvit Road, Prakanong, Klongtoey
••••• Bangkok 10110, Thailand

••••• E-mail: apeid.bgk@unesco.org

••••• Website: www.unesco.org/bangkok

••••• Tel: +66-2-3910577 Fax: +66-2-3910866