

# TECHNOLOGY, BROADBAND AND EDUCATION ADVANCING THE EDUCATION FOR ALL AGENDA

## EXECUTIVE SUMMARY



United Nations  
Educational, Scientific and  
Cultural Organization



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In 2000, the majority of governments worldwide adopted the eight Millennium Development Goals for 2015, which include achieving universal primary education as well as promoting gender equality.

Contributing to this effort are the Education for All goals established by UNESCO, also adopted in 2000. Both frameworks call for every citizen to be empowered with the knowledge, skills and values needed to lead a fulfilling and productive life. Education is not only a fundamental human right; it is also an enabling force for sustainable development.

Information and communication technologies (ICTs) are essential tools for reaching such development

goals. Indeed, in the increasingly interconnected and knowledge-driven world of the 21<sup>st</sup> century, education cannot be separated from ICTs. *Technology, Broadband and Education: Advancing the Education for All Agenda*, the outcome report of the Broadband Commission's Working Group on Education, provides a vision of how access to these technologies might be expanded so that students and teachers everywhere can reap the benefits – for themselves and for their communities.

By analysing current trends and data, the report aims to explain why certain strategies and activities are effective while others are not, and offers guidance for better-informed decision-making at the school level and beyond.

## SETTING THE STAGE

The report begins with a brief overview of the rationale for expanding and improving the use of ICTs in education. It stresses that participation in the global economy is increasingly dependent on the 21st-century skill of navigating the digital world. However, traditional school curricula tend to prioritize the accumulation of knowledge above its application, and many systems fail to adequately train students in how to become responsible digital citizens, or prepare them to sustain their employability throughout their lives in a knowledge economy.

Expanding access to, and proper use of, ICTs will solve this challenge, while at the same time increasing the efficiency of school systems, improving teacher training and resources, and extending learning opportunities beyond the classroom and to disadvantaged groups. Governments – in developing countries in particular – need to explore ways to bridge the digital divide and implement policies that encourage increased investment in ICT in education.

Throughout the report, and in the case histories contained in the Appendix, there are concrete examples of these strategies in action.

### What are the key 21<sup>st</sup>-century skills?

The knowledge society and economy call for new skills to be addressed by educational systems. These skills have been described\* as:

- **Ways of thinking:** creativity, critical thinking, problem-solving, decision-making and learning
- **Ways of working:** communication and collaboration
- **Tools for working:** ICT and information literacy
- **Skills for living in the world:** citizenship, life and career skills, and personal and social responsibility.

\*The Assessment & Teaching of 21<sup>st</sup> Century Skills (ATC21S) consortium, 2013.

## WHERE DO WE STAND?

The report goes on to outline the current state of ICTs in education, and gives a snapshot of the policy environment.

### **Who is in school?**

In 2010, according to the UNESCO Institute for Statistics (UIS), 61 million children of primary-school age worldwide, and another 71 million of lower secondary-school age, were not in school, while an estimated 1.7 million extra teachers will be needed to achieve universal primary education. In addition, close to 793 million adults – 64% of them women – lacked reading and writing skills, with the lowest rates in sub-Saharan Africa and South and West Asia.

### **Who is online?**

ITU estimates that, by end 2012, there were close to 2.5 billion people using the Internet – but only a quarter of people in the developing world. In the UN-designated Least Developed Countries, that number drops to a mere 6%. The latest edition of ITU's Measuring the Information Society report shows that wide disparities remain in the level of ICT development.

### **Are ICTs available for education?**

In member countries of the Organisation for Economic Co-operation and Development (OECD), by 2009, some 93% of 15-year-olds had access to a computer and the Internet at school, with a ratio of eight students per computer. In developing countries, on the other hand, access to ICT facilities is a major challenge. For example, a study in Kenya, published in 2010, stated that only 3% of schools had Internet access, while in most African countries, there are on average 150 schoolchildren per computer.

While fixed broadband infrastructure constitutes the bulk of high-speed connectivity for many countries, the ICT service with the steepest growth rate is mobile broadband. According to ITU figures, in 2011, growth in mobile broadband services was 40% globally and 78% in developing countries, where it is often the only way of connecting to the Internet. But a gulf in accessibility remains. At the end of 2011, the penetration level for mobile broadband was only some 4% in Africa (and around 8% in developing countries as a whole), compared with 51% in the developed world.

### **How are ICTs used?**

Broadband connectivity does not, by itself, improve education and has not always been used effectively. Even in OECD countries, data suggest that how much ICTs are used for education – as well as how well – are both still at low levels. Children in the classroom are frequently limited to searching for information via computer, rather than processing and sharing it – ironically, the exact opposite of how they tend to use ICTs during their free time. Teacher training must be improved in this area, and appropriate educational resources developed and shared in response to local needs.

## HOW ICTs CAN HELP

In a section entitled 'Strategic Directions', the report looks at ways in which ICTs can increase the efficiency and efficacy of teaching and learning, while increasing equality in educational opportunity.

### **Supporting teachers**

ICTs help teachers in various ways, such as by enabling them to streamline their work and prepare for class. In addition, innovative teaching materials and methods can be more easily discovered, as well as customized for individual students, including those with special educational needs. Finally, ICTs can facilitate communication among teachers, students, parents and administrators.

### **Supporting students**

As yet, little direct evidence is available about the impact of ICTs on improving learning outcomes. This might be because the ratio of students to computers at schools remains high. However, the falling cost of equipment and the advent of new devices specifically targeted at children, as well as innovative approaches such as using several mice for accessing a single computer, are all contributing to a more student-centred approach to ICTs in education.

### **Mobile learning**

It is the potential of mobile devices that is most likely to boost the use of ICTs in education. Already, countries are considering providing children with tablet computers in place of textbooks. The Republic of Korea, Thailand and Turkey, for example, have all announced large-scale programmes towards this goal. As well as being easy to update, digital textbooks can help students learn independently according to their own abilities and interests. And today, many learners are likely to have access to ICT at home, at school – in fact, everywhere they go. Mobile learning, therefore, is now integral to education.

## Mobile technologies support education

A study\* by UNESCO finds that the benefits to education of technologies such as phones and tablet computers include:

- Expanding the equality of educational opportunities
- Facilitating personalized learning, anywhere and at any time
- Offering immediate feedback and assessment
- Ensuring the productive use of time spent in classrooms
- Building new communities of learners
- Bridging formal and informal learning
- Minimizing educational disruption in conflict and disaster areas
- Assisting learners with disabilities
- Improving administration, and communication with teachers and parents
- Maximizing cost efficiency.

\* Working Paper Series on Mobile Learning. Paris, UNESCO, 2012.

### **Empowering women and girls**

ICTs need to be made more available to women and girls. A report published in 2012 by Intel found that across the developing world, on average, nearly 25% fewer women than men have access to the Internet. More alarmingly still, that gender gap increases to nearly 45% in regions such as sub-Saharan Africa.

A study in 2010 by the GSMA indicated that in low and middle-income countries, a woman is 21% less likely to own a mobile phone than a man. There are growing efforts to address this imbalance, and to use ICTs to expand female education. UNESCO's

'Mobile Phone Literacy – Empowering Women and Girls' project studied initiatives around the world, including, for instance, literacy promotion for girls in rural Pakistan.

Another challenge relates to women's integration and participation in the labour market, which faces a shortage of ICT skills in many countries. Unfortunately, it is often the case that girls regard careers in this field as unattractive or 'unfeminine'. ITU has been making a concerted effort to tackle this perception and to promote opportunities for women and girls that also benefit society as a whole (see box).

## Girls in ICT

International Girls in ICT Day, held on the fourth Thursday of April each year, is an initiative backed by ITU Member States to empower and encourage young women to consider careers in ICT. In 2012, more than 1,300 activities in nearly 90 countries marked the day, involving more than 30,000 girls worldwide. The Girls in ICT web portal gives details of these events, as well as analysis, information on training, and profiles of successful women in the field of ICTs.

To further promote this work, on 11 October 2012, the first ever UN International Day of the Girl Child, ITU launched a Tech Needs Girls campaign. Its website enables young women to share their ideas, and it features a mapping tool that pinpoints initiatives around the world – motivating stakeholders and allowing girls to find out what is available in their localities.

## POLICIES FOR THE FUTURE

The final two sections of the report examine strategies that countries (particularly developing ones) should embrace in order to reap the full benefits of ICTs in education. To help achieve the Millennium Development Goals, and those of Education for All, the report recommends that governments and all stakeholders in education should:

### 1. Increase access to ICTs and broadband

Policy-makers should continue efforts to implement cross-sectoral policies that ensure affordable and equitable access to ICTs and broadband connectivity for all citizens, particularly women and girls and marginalized groups.

### 2. Incorporate ICTs into job training and continuing education

Given the rapid pace of technological change and such challenges as high youth unemployment, governments should provide financial incentives to support the adoption of ICTs and the provision of broadband in all activities designed to create new jobs and offer lifelong training.

### 3. Teach ICT skills and digital literacy to all educators and learners

Governments should prioritize the redesign of education systems so as to better respond to the digital revolution. Empowering teachers and students to use ICTs effectively is central to improving education and the assessment of learning.

### 4. Promote mobile learning and open educational resources

Policy-makers should introduce incentives for the development of open educational resources (see box). In addition, the use of mobile technology should be encouraged at all levels and in all forms of education, facilitating access to high-quality learning.

### 5. Support the development of content adapted to local contexts and languages

Getting the ICT hardware in place is just one element: investment also needs to be made in creating ecosystems of online educational applications and services with local content and in local languages.

### 6. Work to bridge the digital divide

Policy-makers should continue efforts to bridge the digital divide between developed and developing countries, by promoting international collaboration and partnerships.



### Open educational resources: the example of TESSA

Open educational resources (OERs) are teaching, learning or research materials that are in the public domain or released with an intellectual property licence that allows for free use, adaptation and redistribution. One of the most successful examples is the Teacher Education in Sub-Saharan Africa (TESSA) project, which has produced a large bank of materials aimed at improving access to, and the quality of, local school-based education and training for teachers. All the materials are available online in a variety of formats and languages. It is estimated that by 2010 more than 400,000 teachers in 19 teacher education programmes had benefited.

In order to achieve the internationally agreed goals in education by 2015, more efforts will have to be made by all stakeholders – international organizations, governments, education authorities, IT providers, telecommunication operators, civil society and the private sector. But there is no doubt that broadband is a great education enabler and that the future of education at all levels and in all forms is inextricably linked to the benefits offered by affordable high-speed connectivity to the Internet.

**Broadband is a key factor for socio-economic development; put simply, there can be no education for all without inclusive broadband for all.**



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