Highlight: Advanced Learning Technologies

R-learning = improved learning results?
In recent years, R-learning (robot-based learning) has emerged as one of the efforts to adopt innovative technology in education for the improvement of education. Despite it being only at an emerging stage for now, it already appears to have a high potential and will certainly encourage the development of new and rich ways of teaching and learning in the future.

Analysis of Recent 1:1 Learning Initiatives in Primary and Secondary Schools in Europe
The project “Overview and analysis of one-to-one computing initiatives for Education and Training in Europe” (1to1Learning) aimed to provide an overview of recent 1:1 learning initiatives in primary and secondary schools across European countries, and to identify major bottlenecks and barriers to the implementation of 1:1 learning in schools.

Making sense of MOOCs
Massive Open Online Courses (MOOCs) have captured the attention of many leaders in education and development. In this excerpt from his new research paper, "Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility", former COL President Sir John Daniel explains that while MOOCs will prompt universities to improve the quality of teaching, they will not help expand higher education in developing countries.

News & Events
Regional workshop discussed ICT in Education policy, infrastructure and ODA
On March 5th and 6th, the ICT-in-Education programme of UNESCO Bangkok, with the generous support of the Korean Institute for Science and Technology (KIST), convened a Regional Consultation Workshop on ICT in Education Policy, Infrastructure, and Official Development Assistance Status. The workshop was attended by delegates with expertise in ICT-in-Education from Cambodia, Indonesia, Lao PDR, Malaysia Myanmar, Singapore, Thailand, and Vietnam, along with senior staff from KIST and UNESCO Bangkok.

Mobile learning: “We cannot continue to live in the pre-digital era”
“The future of education is incredibly exciting,” a filmmaker and educator told policymakers and education professionals at the UNESCO/ GSMA forum, part of the second UNESCO Mobile Learning Week which focused on achieving Education for All by increasing education access, quality and equality via mobile learning.

Broadband “the missing link” in global access to education
A new report from the Broadband Commission highlights strategies for leveraging high-speed networks to realize ‘Education for All’.

Safer Internet Day 2013 – for a safer and better internet for children
Safer Internet Day (SID) is a worldwide event to promote safer and more responsible use on online technology and mobile phones especially among children and young people. Tuesday, 5
February 2013 marked the 10th edition of the event under the theme of ‘online rights and responsibilities’ and encouraging internet users to ‘connect with respect’.

UNESCO Associated Schools - have your video cameras ready!
UNESCO Associated Schools are invited to submit short, creative videos of five minutes maximum in length, addressing key challenges related to migrant integration, inclusiveness, identity, diversity, human rights and social cohesiveness, both at local and global levels.

Programmes & Projects
Digital StudyHall
Digital StudyHall (DSH) is an innovative project which uses ICT to improve quality and accessibility of education in rural and slum schools in India. DSH digitally records classes by the best grassroots teachers in order to create a large database which can distributed on DVDs to schools in poor rural areas and in slums.

Resources
Publications by UNESCO Institute for Information Technologies in Education
The UNESCO Institute for Information Technologies in Education (IITE) published six new policy briefs during the past year, in order to disseminate new achievements, teaching methodologies and concepts in the field of ICT in education.

Technological Pedagogical Content Knowledge (TPACK) explained
TPACK attempts to identify the nature of knowledge required by teachers for technology integration in their teaching, while addressing the complex, multifaceted and situated nature of teacher knowledge.

First online climate change education course for teachers
This innovative training kit, entitled UNESCO Course for Secondary Teachers on Climate Change Education for Sustainable Development (CCESD), is designed to give teachers confidence, through a series of six-day programmes, to help young people understand the causes and consequences of climate change today.

A parent's guide to 21st-century learning
Discover the tools and techniques today’s teachers and classrooms are using to prepare students for tomorrow -- and how you can get involved.

Highlight: Advanced ICT

R-learning = improved learning results?
What is R-learning?
In recent years, R-learning (robot-aided learning) has emerged as one of the efforts to adopt innovative technology in education for the improvement of education. By their narrow definition, R-learning refers to the “supply of young children education robots and contents according to the curriculum”. More broadly, it is defined as the “shift to digital education and the evolution of consilience integrating robot, contents, education program, and physical environment altogether” (KIST, 2013).

R-learning can differ depending on the type and role of the robot as well as its target group and applications offered: robots can work autonomously or be tele-operated, as (peer) tutors or tutoring assistants; they can be used by teachers, children and parents, for different subjects and offer conversation, edutainment and other services (Han, 2010). Unlike general computers and e-learning, robots can suggest the learners to start and response to them through autonomous recognition. Furthermore, they are able to interact with learners through direct contact, e.g. by hugging or petting, and provide physical activities to reinforce learning. Robots as peer-tutors have become the most dominant form of R-learning, followed by teaching assistant robots (Han, 2010).

**The case of the Republic of Korea: the R-learning System Project**

One example of R-learning through learning and teaching assistant robots can be found in the Republic of Korea. Since January 2010, the Korean Ministry of Education, Science and Technology (MEST) has been in the process of establishing a robot-based learning (R-learning) system as part of the Plan of the Advancement of Early Childhood Education as announced on the 9 November 2009. MEST’s R-learning project is designed to maximize the synergy of combining education and scientific technologies. Experts and practitioners involved in early childhood education expect that such robotic systems will play a role in helping teachers, thereby advancing the development of education systems and consequently contributing to promoting creativity and character development for young children.

In order to develop R-learning systems and foster their use for educational purposes the MEST has been working closely with the Korean Institute of Science and Technology (KIST). As part of the R-learning Project several measures have been taken, including teacher training, development and supplies of R-learning content materials as well as building an R-learning infrastructure and the development of the educational robots. For the first years of operation (2009-2010) 10% of all kindergartens in the Republic of Korea were chosen as pilot sites. Between 2011 and 2013 up to 50% of kindergartens are expected to be provided with robots (for more information, see KIST Leaflet).

**R-learning in practice: Genibo edu and iRobiQ**
The KIST R-learning System Project offers a clear example for how and in which educational contexts robots can be deployed. The intelligent robot dog Genibo edu is specifically designed for early childhood education, offering different “play-based learning” activities (songs, games, role plays etc.) to enhance children’s social and emotional development by interacting through emoticons, sound effects and motions (cf. KIST Leaflet).
Another example for use in primary or secondary education is iRobiQ: It works as a learning and teaching assistant, offering children’s songs, English learning contents and games as well as a communication tool that checks attendances, collects learner portfolios and gives parents insight into their children’s learning achievements. Among other administrative functions it also wirelessly connects to server computers that make it possible for teachers to create, up- and download learning and teaching materials. 

R-learning = improved learning results? 
Experts and practitioners involved in early childhood education related work expect that such robotic systems would be helpful for advancing the education system and promoting creativity and character development for young children. In terms of education system, R-learning enables integrated information management and education management and facilitates information sharing through creating communities among various stakeholders. Also, by supporting self-directed learning R-learning is expected to promote early childhood development.(cf. KIST Leaflet).
However, these claims have not gone uncontested. Many concerns about the dysfunctional aspects of technology, over exposure to technology in early childhood have been raised among teachers and education sectors. To address these concerns, bunch of studies have been conducted for a long time, and the impact of R-learning on early childhood education has been assessed in the area of physical, linguistic, cognitive, social and emotional development. One of the interim reports, “The impact of education based on R-learning robot platform(R-learning) on children’s pro-social behavior and emotional expression” (2006), a study conducted by KIST R-learning Center collaborating with experts in Korea Early Childhood Education Society, tried to measure the impact of R-learning systems in the area of social and emotional development of children. The study was conducted with 50 children in a randomly chosen kindergarten. These homogenous children were divided into two groups and the children in the experimental group who were treated with R-learning system showed significant difference with the children in the control group. They showed (positive) progress in both pro-social behavior and emotional development, in line with many other precedent studies (Davis, et al., 2005; Dautenhahn, 1999; Koizima, 2002; Koizima, et al., 2005; Ruvolo, Fasel, & Movellan, 2008; Tanaka et al.,2006, 2007; Tanaka & Movellan, 2006; Werry et al., 2001; Werry & Dautenhahn,1999)(recitation)(KIST, 2006).

Even though a certain consensus has been achieved by communities involved in r-learning about the fact that educational robotics are valuable, the long term effects of R-learning are yet to be measured and rigorous research methodologies are still an issue to secure validity and reliability of the evidences. Numerous workshops, conferences and publications have focused on the issue. Yet many of these show certain sub-optimal properties, such as referring to very restricted experimental populations, and the missing of a pedagogical and methodological framework as well as significant quantitative and qualitative evaluations (Bredenfeld, Hofman, & Steinbauer, 2010). The involvement of multiple (at times also competing) stakeholders, especially the diversity of technologies and approaches makes such a direct comparison and evaluation nearly impossible. As a result, a more systematic and validated foundation and methodology are needed so as to make R-learning a more valuable and reliable approach in education.

Many concerns are being raised on the subject of robots’ use in educational settings and a rigorous research needs to be done in order to make sure R-learning can be put into practice in a scientifically founded and pedagogically meaningful way. Despite it being only at an emerging stage for now, it already appears to have a high potential and will certainly encourage the development of new and rich ways of teaching and learning in the future.

References and further readings:

- Han, J. (2010). Robot-Aided Learning and r-Learning Services, access online via: http://cdn.intechopen.com/pdfs/8632/InTech-Robot_aided_learning_and_r_learning_services.pdf
- KIST (2006). The impact of education based on R-learning robot platform(R-learning) on children’s pro-social behavior and emotional expression(Korean), pp.75-87
- KIST (2013). Robot Based Learning for Early Childhood Education in Korea. Presented at the UNESCO Regional Consultation Workshop on ICT in Education Policy, Infrastructure, and ODA Status in Selected ASEAN Countries, Bangkok, 5-6 March 2013.
- KIST website (engl): http://eng.kist.re.kr/kist_eng/main/
Analysis of recent 1:1 learning initiatives in primary and secondary schools in Europe

By Yves Punie and Panagiotis Kampylis, European Commission, Joint Research Centre, Institute for Prospective Technological Studies (IPTS), Spain; Stefania Bocconi, Italian National Research Council, The Institute for Educational Technology, Italy.

In recent years, large- and small-scale one-to-one (1:1) initiatives have been launched in a number of European countries. Inspired mainly by the pioneering One Laptop Per Child programme, 1:1 computing initiatives in Europe aim to equip students and teachers of a targeted school, class or age group, with a portable mobile computer device (i.e. laptop, notebook, tablet or smartphone) for continuous use both in the classroom and at home. 1:1 indicates the ratio of devices to users, i.e. one device per learner. More recently, however, the focus seems to have shifted away from the device to changing the way of learning with each student taking a more active role based on the use of his/her personal device in a connected and well equipped classroom; hence the emphasis on 1:1 learning rather than on 1:1 computing.

The project “Overview and analysis of one-to-one computing initiatives for Education and Training in Europe” (1to1Learning) was launched by JRC-IPTS1 and was carried out by European Schoolnet (EUN) from January 2012 to December 2012. The project aimed to provide an overview of recent 1:1 learning initiatives in primary and secondary schools across European countries, and to identify major bottlenecks and barriers to the implementation of 1:1 learning in schools. The study’s findings were discussed with experts and stakeholders in order to reach a consensus on policy options for scaling-up 1:1 learning experiences that successfully promote technological, pedagogical and organizational innovation in Education and Training.

The 1to1Learning project identified 29 recent 1:1 initiatives (dating back no earlier than 2008) with significant scale and/or scope from 19 European countries. These included large-scale initiatives involving a total estimated number of more than 620,000 schools and 16,800,000 students across European countries. The majority of students were from Turkey (15,000,000), Spain (635,000) and Portugal (600,000).

---

1 The Institute for Prospective Technological Studies (IPTS) is one of the seven research institutes that make up the European Commission’s Joint Research Centre (JRC)
The main beneficiaries of the 1:1 initiatives identified in Europe were the students and teachers, who in most cases received laptops and netbooks, in some cases tablets and in a few cases, smartphones. In most of the initiatives, students owned the devices and could use them for their activities in and out of school. In other cases, the equipment was owned by the schools and in a few initiatives, the Ministry of Education owned the devices and lent them to the schools. Half of the identified initiatives covered both primary and secondary education, six covered primary education only, and seven initiatives addressed solely secondary education.

Most of these 29 initiatives aimed to promote a 1:1 learning model that would lead to pedagogical change and innovation. Another key objective was to address economic inequalities by improving students’ access to ICT and promoting e-inclusion on a more general level. To improve students’ ICT skills and motivation, or to expand ICT provision in schools by further reducing computer-per student ratios was the goal of around one third of the initiatives.

Initial findings of the 1to1Learning project show the existence of different types of teacher training activities, including training sessions organised by the schools themselves, external training activities provided by local/national educational authorities, or universities, or by the technology companies that equipped the schools.
Most of the initiatives were evaluated by external experts. These evaluation studies showed a positive impact on students’ motivation and the promotion of student-centred learning. Only a few evaluations highlighted the impact on students’ learning outcomes and the role of parents as beneficiaries of the 1:1 initiatives. Key findings from the i1to1Learning study also show the need to strategically plan the implementation of 1:1 initiatives, focusing on a greater number of systemic enablers of innovation. These include encouraging a pedagogical culture by building teachers’ networks and creating incentives for teachers. Clear long-term implementation strategies and adequate training measures are also needed to make mainstreaming of initiatives both sustainable and effective.

The 1:1 learning initiatives in Europe can be analyzed through the *mapping framework of ICT-enabled innovation for learning* developed by JRC-IPTS in the context of the SCALE CCR study (Kampylis, Bocconi & Punie, 2012). The mapping framework (Figure 2) provides a "snapshot" of their current state of development and offers valuable insights on the emerging trends regarding the nature, the reach, the target groups and the impact of 1:1 innovation in learning.

*Figure 2. The mean reach and impact of the 29 1:1 learning initiatives in Europe (Source: Bocconi, Kampylis & Punie, 2013)*
Overall, 1:1 learning initiatives in Europe can be considered as mostly incremental (nature of innovation), moving progressively to more radical approaches where the emphasis lies on active learners and 1:1 pedagogies. It is interesting to note that about half the 1:1 initiatives have already reached a significant scale, involving a large number of students (e.g. 180,000 in Norway and 113,226 in Greece) and are moving towards mainstreaming (e.g. 600,000 students in Portugal, 634,549 in Spain and 15,000,000 in Turkey) (implementation phase). More than half the initiatives are embedded in regional/national strategies (access level) but only one initiative was cross-border, involving learners from six European countries. The vast majority of the analyzed 1:1 initiatives are at service level, addressing key aspects related to the provision of equipment to schools and the development of infrastructures both inside and outside schools (impact area). The main beneficiaries (target) of 1:1 initiatives, in fact, are still the students and teachers who received laptops and netbooks in most cases. Given the current economic conditions in many European countries, the sustainability of such initiatives is under pressure as they are dependent mainly on public funds. In order to make the mainstreaming of 1:1 initiatives sustainable and effective, strategic planning and multi-stakeholder involvement are required.

In particular, strategic planning should be medium- or long-term and should include clear implementation strategies, evaluation and monitoring procedures, and effective training and support mechanisms for both school members and families. It should not only focus on students’ achievements but on a number of other essential elements (e.g. students’ engagement, attendance, behaviour, and motivation) and cater for a combination of the technological, pedagogical and organizational dimensions of innovation (i.e. including changes in the curriculum, assessment, timetables, teachers training on 1:1 pedagogies). In this perspective, a variety of stakeholders play an important role as key change agents in 1:1 innovations. At system level, the regional/national government is responsible for ICT policy and vision, funding, curriculum, assessment, and teacher training. At school level, school leaders have a strategic role in leading and managing the innovation process and creating capacities within the school. Teachers are key change agents as regards facilitating students’ learning and within the process of implementing 1:1 initiatives.

Several initiatives also highlighted the importance of including parents in the process as they are committed to children’s well-being, learning, and development. Parents are one of the most critical interest groups, especially as regards investment (financing devices) and security.

The final report of the 1to1Learning study is expected to be published by EC JRC-IPTS in Summer 2013.

References:

Making sense of MOOCs

By Sir John Daniel

Massive Open Online Courses (MOOCs) have captured the attention of many leaders in education and development, including former COL President Sir John Daniel. In this excerpt from his new research paper, "Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility", Sir John explains that while MOOCs will prompt universities to improve the quality of teaching, they will not help expand higher education in developing countries.

Discourse about MOOCs is overloaded with hype and myth while the reality is shot through with paradoxes and contradictions. However, an important process is underway that will chart new paths for the universities involved and for higher education generally.

This development may fall apart. Some earlier Internet ventures of elite universities that started with fanfare were wound up shamefacedly only six years ago. This time, however, the scale of the involvement is such that something will survive, even if some who can well afford it lose money on the way. We envisage that MOOCs will have an important impact in two ways: improving teaching and encouraging institutions to develop distinctive missions.

But first, we agree with Bates (2012) that what MOOCs will not do is address the challenge of expanding higher education in the developing world. It may encourage universities there, both public and private, to develop online learning more deliberately, and OER from MOOC courses may find their way, alongside OER from other sources, into the teaching of local institutions.

We have long argued that higher education must find ways to address the needs of those at the bottom of the pyramid (Prahalad, 2004) but institutions in those countries will eventually do that, using technology, and it is unlikely that they will make fortunes.

We also agree with Bates that current “xMOOCs” pedagogy is pretty old hat but this will now change fast. Even if Coursera gave its partner universities great freedom in course formats in order to sugar the pill of signing the contract, this will quickly produce a great diversity of approaches and much healthy experimentation. By the end of 2012 various actors from the media through student groups to educational research units will be publishing assessments of xMOOC courses. These will quickly be consolidated into league tables that rank the courses – and the participating universities – by the quality of their offerings as perceived by both learners and educational professionals (Uvalić-Trimbić & Daniel, 2011).

This will not please the participating universities. Elite universities in the UK thoroughly disliked the state-approved teaching quality assessment system that operated there between
1995 and 2004 (Laughton, 2003). Eventually their presidents successfully petitioned the authorities to close it down. My own conclusion was that behind the fog of methodological arguments about the difficulty of assessing teaching quality, the real problem was that some elite universities did poorly and some lesser-known institutions did well. The difference with the xMOOCs assessments and rankings is that no one will be able to abolish them by appealing to authority. Institutions that rate poorly will either have to quit playing xMOOCs or raise their game.

This, in turn, will put a focus on teaching and pedagogy to which these institutions are unaccustomed, which will be healthy. At the same time academics all around the world will make judgments about the intellectual quality and rigour of the institutions that have exposed themselves in this way. Other combinations of institutions and commercial partners will join the fray and a new pecking order will emerge.

With luck, the dream of the great American educator Ernie Boyer (1990) may even come true. In 1990, in Scholarship Reconsidered: Priorities of the Professoriate, he wrote: “We need a climate in which colleges and universities are less imitative, taking pride in their uniqueness. It’s time to end the suffocating practice in which colleges and universities measure themselves far too frequently by external status rather than by values determined by their own distinctive mission”.

The broader purpose of Boyer’s book was to encourage the emergence of a scholarship of teaching alongside the scholarships of discovery (research), integration (multidisciplinary) and application (development). Placing their xMOOCs in the public domain for a worldwide audience will oblige institutions to do more than pay lip service to importance of teaching and put it at the core their missions. This is the real revolution of MOOCs.

--------------

The full research paper is available at [http://tinyurl.com/Making-Sense-of-MOOCs](http://tinyurl.com/Making-Sense-of-MOOCs)


A recent post on COL’s blog: [www.col.org/blog166](http://www.col.org/blog166)

Some of the online discussion sparked by Sir John’s research paper: [www.tonybates.ca](http://www.tonybates.ca), click on the post dated 1 October 2012.

Further information:

- [Making sense of MOOCs](http://www.tonybates.ca)
Regional workshop discussed ICT in Education policy, infrastructure and ODA

On March 5th and 6th, the ICT-in-Education programme of UNESCO Bangkok, with the generous support of the Korean Institute for Science and Technology (KIST), convened a Regional Consultation Workshop on ICT in Education Policy, Infrastructure, and Official Development Assistance Status. The workshop was attended by delegates with expertise in ICT-in-Education from Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, and Vietnam, along with senior staff from KIST and UNESCO Bangkok.

The workshop was a final step in the review and updating process of a forthcoming publication by UNESCO Bangkok on the status of ICT-in-Education in selected ASEAN countries. In his welcoming address, Etienne Clement, Deputy Director of UNESCO Bangkok, noted that ICT-in-Education was a primary driving force behind the realization of UNESCO’s mission to achieve universal access to quality educational opportunities. This mission was continued in a speech by Byung-Ok Yoon, Secretary-General of KIST, who described the need for research to link educational outcomes to innovative technologies such as robot-enhanced learning.

Representatives from KIST provided a demonstration of their research on the construction of robots for use in early childhood education. The robots facilitate basic administrative tasks while providing a flexible and adaptable source of lesson material. Early research results have
shown great potential for the use of these robots with children with learning differences. While country delegates agreed that the universal application of ‘r-learning’ was not yet a possibility, the demonstration provided a strong reminder of advances being made at the frontiers of ICT-in-Education.

The assembled country delegates then provided a series of frank assessments on recent changes to the overall policy environment regarding ICT in Education, including focal points and key decision-making criteria. Those countries receiving official development assistance (ODA) described the successes and failures of their interactions with the international community, closing with firm recommendations for best practices moving forward. As expected, each nation had unique challenges to confront in its quest to provide the best possible education for all students. The workshop results will be synthesized into a final report by UNESCO Bangkok which will be published within the year.

Given the successful sharing of information and building of relationships, workshop participants agreed to work towards developing annual meetings. There was firm agreement that the development of a network of connections between ministries, schools, and educational organizations across the ASEAN region was critical to meeting each nation’s goals for the development of ICT-in-Education.

Further information:

- Korea Institute of Science and Technology (KIST)

Related links:

- Regional and Country Information on ICT in Education

Previous issues of the e-newsletter:

- UNESCO "ICT in Education" Announcement e-newsletter

What do you think about this topic?
Mobile learning: “We cannot continue to live in the pre-digital era”

Filmmaker and educator David Puttnam photographed a lush Irish landscape with his tablet computer before filming his presentation for a forum on mobile learning and policy at UNESCO Headquarters in Paris on 20 February.

Holding his tablet to the camera, he reminded the audience that the power to reach out to the world was now at everyone’s fingertips. From his home in Ireland, he was not only able to film his surroundings, but also lecture students in Australia, Singapore, the United Kingdom and the United States.

“The future of education is incredibly exciting,” Puttnam told policymakers and education professionals at the UNESCO/ GSMA forum, part of the second UNESCO Mobile Learning Week (18 - 22 February 2013) which focused on achieving Education for All by increasing education access, quality and equality via mobile learning.

The outlook for mobile learning is promising. Mobile devices such as tablets, mobile phones and e-readers are being used by increasing numbers of people, with mobile phone subscriptions globally hitting a record-breaking high of 6 billion in 2012. As the cost of mobile phone ownership declines, mobile devices are being adopted in areas of great poverty, where even schools, books and computers are scarce.

The opportunities presented by mobile learning, particularly for learners who lack access to high quality education, is immense. One example of this, is the UNESCO Mobile Literacy Project in rural Pakistan, which uses mobile phones to complement a traditional face-to-face literacy course for adolescent girls. The project has produced impressive results, with the number of girls receiving an ‘A’ grade upon completion of the literacy course jumping from 28% to 60% after the introduction of the mobile devices.

Despite the considerable potential however, mobile technology was still not being adequately leveraged for education purposes, Janis Karklins, UNESCO’s Assistant Director-General for Communication and Information told forum attendees. “We cannot continue to pretend that we live in the pre-digital era, and to do so risks plunging schools into irrelevance. We live in a world where many, if not most young people carry a powerful, easy mobile computer in their pockets,” he said. “The question is not whether schools and school systems will engage with these mobile technologies but when they will and how they will.”

To mark Mobile Learning Week, UNESCO launched a set of Policy Guidelines for Mobile Learning, with Mr Karklins urging participants to join him in exploring how mobile
technologies can widen learning opportunities for all. Anne Bouverot, Director-General of the GSMA, said she was confident mobile learning was ready to go to the next phase.

“We believe that we can go to the next level, and we can move to large-scale, government backed, successful, mobile education programs around the world,” Ms Bouverot proclaimed.

Further information:

- Mobile learning: “We cannot continue to live in the pre-digital era”

Related links:

- Learning with mobile technologies
- EFA crowdsourcing challenge prize winners
- Inviting public input on the UNESCO Policy Guidelines on Mobile Learning
- UNESCO leads discussion on mobile learning at WSIS Forum
- UNESCO and NOKIA held workshop on mobile technologies for teachers
- Mobile Science Project: Engaging students in science through mobile learning

Previous issues of the e-newsletter:

- UNESCO "ICT in Education” Announcement e-newsletter

What do you think about this topic?

- Visit our on-line forum and share your views

Broadband “the missing link” in global access to education

Broadband connectivity carries unprecedented potential to bridge education divides, transform learning and improve skills for the globalized economy provided that governments make broadband accessible, empower teachers and students to use technology, support the production of local language content and promote open educational resources, says a new report just released by the Broadband Commission for Digital Development.
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 high-speed technologies over both fixed and mobile platforms can be extended so that students and teachers everywhere can reap the benefits – for themselves and for their communities.

The report was presented during the opening session of the World Summit on the Information Society +10 at UNESCO’s Paris Headquarters from 25 to 27 February, in the presence of UNESCO Director-General Irina Bokova and Hamadoun I. Touré, Secretary-General of the International Telecommunication Union (ITU), who co-chair the Broadband Commission. It will be presented to all of the Broadband Commissioners at the 7th meeting of the Broadband Commission, on March 17 in Mexico City, hosted by the Carlos Slim Foundation.

Coordinated by UNESCO, it emphasizes the importance of deployment of broadband as a means of accelerating progress towards the Millennium Development Goal of Universal Primary Education and the Education for All goals. Less than three years away from the target date for achieving these goals, 61 million children of primary-school age, and a further 71 million of lower secondary-school age, are not in school; and 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 – lack literacy skills, with the lowest rates in sub-Saharan Africa and South and West Asia.

“Much progress has been made to reach the 2015 education goals – but many countries are still not on track,” Irina Bokova said. “In this respect, the digital divide continues to be a development divide. The on-going mobile and internet revolutions provide all countries, especially developing and least developed ones, with unprecedented opportunities. We must make the most of broadband to widen access to quality education for all and to empower all citizens with the knowledge, skills and values they need to live and work successfully in the digital age.”

The report recognizes that participation in the global economy is increasingly dependent on skills in navigating the digital world, but warns that traditional school curriculums still tend to prioritize the accumulation of knowledge above its application, and fail to train students in the ICT literacy skills they will need to ensure their employability in the knowledge economy.

“The ability of broadband to improve and enhance education, as well as students’ experience of education, is undisputed,” said Dr Hamadoun Touré. “A good and well-rounded education is the basis on which future livelihoods and families are founded, and education opens up minds, as well as job prospects. A student in a developing country can now access the library of a prestigious university anywhere in the world; an unemployed person can retrain and improve their job prospects in other fields; teachers can gain inspiration and advice from the resources and experiences of others. With each of these achievements, the online world brings about another real-world victory for education, dialogue, and better understanding between peoples.
Despite rapid increases in access to fixed and mobile broadband, the digital divide remains deep. The International Telecommunications Union 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 Least Developed Countries, that number drops to a mere 6%. The latest edition of ITU’s Measuring the Information Society report reveals wide global and regional disparities in both the level of ICT development and the cost of monthly broadband access, which in some 17 countries still represents over 100% of an average monthly salary.

The report confirms that, by 2009, in OECD countries about 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 remains 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 in 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.

The report is the result of collaborative input from a large number of Commissioners and their organizations, including Alcatel-Lucent, the Connect-to-Learn partnership (The Earth Institute, Colombia University/Ericsson/Millennium Promise), Intel, the Inter-American Development Bank, Broadband Commissioners Suvi Lindén, Jasna Matić and Ivo Ivanovski, and Special Advisor to the Commission, Paul Budde.

It features case studies from both developed and developing countries, including Literacy Promotion through Mobile Phones in Pakistan and the Harmonizer Programme in Northern Uganda that educates youth in conflict resolution, ICT and social media skills, both supported by UNESCO.

**Policy recommendations**
The new Broadband Commission Report endorses a number of strategies that governments (particularly those in the developing world) and other stakeholders involved in education should embrace in order to reap the full benefits of ICTs:

1. **Increase access to ICTs and broadband**
   Policy-makers should continue efforts to implement cross-sectorial 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 respond better 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. 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.

Download the full version of the new report at:

Download a 2-page ‘highlights’ document at:
http://www.broadbandcommission.org/work/working-groups/education/Education_report_highlights.pdf

For more information on the Broadband Commission, visit: www.broadbandcommission.org

Follow the Broadband Commission on Facebook: www.facebook.com/broadbandcommission

Follow the Broadband Commission on Twitter: www.itu.int/twitter

Further information:

- Broadband “the missing link” in global access to education
Safer Internet Day 2013 – for a safer and better internet for children

“The internet is positive for children – not just for online education, but as a place to socialise, play and create. But whether they’re doing it for work or play, they must be able to do it safely, to forge positive relationships and cope with online risks”

Neelie Kroes, Vice-President of the European Commission

Safer Internet Day (SID) is a worldwide event to promote safer and more responsible use on online technology and mobile phones especially among children and young people. Over the years, Safer Internet Day has become a landmark event in the online safety calendar. Starting as an initiative of the EU SafeBorders project in 2004, and taken up by the Insafe network of European Safer Internet Centres as one of its earliest actions in 2005, Safer Internet Day has grown beyond its traditional geographic zone and is now celebrated in more than 100 countries worldwide, and across six of the world’s seven continents.

Tuesday, 5 February 2013 marked the 10th edition of the event under the theme of ‘online rights and responsibilities’ and encouraging internet users to ‘connect with respect’. In order to showcase this year’s slogan, the Safer Internet Day video spot was created helping to spread the message in a powerful, visual way.
Insafe, working in partnership with INHOPE (the International Association of Internet Hotlines), has raised awareness among all stakeholder groups - such as children and young people, parents, carers and educators, industry and the third sector - of their respective rights and responsibilities in relation to the online world, fostering a partnership to make the internet a safer - and better - place.

It has never been clearer that the protection and empowerment of young people in today’s digital world can only be achieved through the collaboration of multiple stakeholders. European institutions (European Commission, European Parliament and Council of Europe), industry stakeholders (for example, Facebook, Google, Microsoft, Vodafone, Liberty Global, Telefónica), government (European Ministers of Education) and citizens have answered the call for action, helping to make this year’s edition of Safer Internet Day the biggest and the best yet.

Safer Internet Day is typically an online celebration. Among the several worldwide events it was broadcasted the Safer Internet Radio, a live 12-hour long radio marathon providing practical advice on online safety issues; multiple conferences, seminars and lectures, often including the participation of children and young people, and the publication of a range of resources.

To learn more about the Safer Internet Day activities that took place this year, check out the Safer Internet Day website [www.saferinternetday.org], or follow SID news throughout the year on Facebook [http://www.facebook.com/SaferInternetDay] and Twitter [https://twitter.com/safeinternetday]. Information on SID 2014 will be released through these channels as it becomes available.

**UNESCO Associated Schools - have your video cameras ready!**

UNESCO Associated Schools are invited to participate in the PLURAL+ Youth Video Festival 2013. They should submit short, creative videos of five minutes maximum in length, addressing key challenges related to migrant integration, inclusiveness, identity, diversity, human rights and social cohesiveness, both at local and global levels.

A prestigious international jury will select three winners in each age category (9-12, 13-17, and 18-25). The winners will be invited to New York, all travel expenses paid, to present their work at the PLURAL + 2013 Awards Ceremony at the Paley Center for Media in December 2013.

PLURAL+ Youth Video Festival is organized each year by the United Nations Alliance of Civilizations (UNAOC) and the International Organization for Migration (IOM) in collaboration with many partners in order to give the voice to the youth around the world to share their views and to encourage their videos creativity.
PLURAL+ 2013 deadline for video submission is 30 June, 2013.

Further information:

- UNESCO Associated Schools - have your video cameras ready!

Related links:

- ASPnet
- Calls for Youth Participation

Previous issues of the e-newsletter:

- UNESCO "ICT in Education" Announcement e-newsletter

What do you think about this topic?

- Visit our on-line forum and share your views

Programmes & Projects

Digital StudyHall

Digital StudyHall (DSH) is an innovative project which uses ICT to improve quality and accessibility of education in rural and slum schools in India. One of the biggest challenges for schools in rural areas and slums is the shortage of qualified teachers. It is not quite common for a government village school to have 200-500 students with fewer than half a dozen teachers working, and these teachers are often not well-qualified to teach many of the subjects that they are required to instruct.

DSH seeks to solve this problem by digitally recording classes by the best grassroots teachers in order to create a large database which can distributed on DVDs to schools in poor rural areas and in slums. Each school in the project is given at least a TV and a DVD player (many schools also need a big lead-acid battery and a DC-to-AC inverter for dealing with intermittent electricity).

Because students cannot learn by just watching these DVDs on TV, a teacher (or a “mediator”)

is placed in between the students and the TV to facilitate learning. This is called “mediation-based pedagogy”. The mediator periodically stops the DVD and engages the students in various activities (asking questions, board work, role playing etc.) based on content on the DVD.

Through this method, the students learn from better skilled and more knowledgeable teachers and the mediator teachers are also trained. The mediator teachers learn the best and appropriate pedagogies and content of subjects with first-hand experiences (“learning by doing”).

“Learning by doing” is currently considered to be one of the best ways to absorb skills and knowledge. This approach of mediator-based pedagogy also has an advantage over short traditional training sessions, because in a short training session topic has to be kept at an abstract level due to time constraints, and as results it is not always clear how such abstract principles should relate to daily topics. This is not the case for mediation-based pedagogy.

Another method used in this project is “peer-mediation” where the brightest students are recruited to serve as mediators in case of teacher absences, which can be frequent in poorer areas. These student mediators appear to display a high degree of responsibility and enthusiasm when they are put in charge.

From the launch of DSH in 2005 to 2008, about 30 schools were covered in the pilot “hubs” in Lucknow, Kolkata, Pune, and Dhaka and the database has grown to contain over 2,500 recordings of lessons in English, maths, and science, in Hindi, Bengali, Kannada, Marathi, Tamil, and English, and 1,500 additional videos of other materials such as stories, special science and history topics, and training sessions. As of spring of 2011, DSH run pilot “hubs” in cities in India, Pakistan, and Nepal.

In a recent evaluation, many positive effects have been observed, including a dramatic rise of student test scores in participating schools, significant improvements in subject matter knowledge and pedagogical skills of local teachers, and increased student participation.

DSH’s successes have been recognized and the project has received many awards, including the 2007 ACM Eugene Lawler Award for Humanitarian Contributions within Computer Science and Informatics, and the top prize in the education category of the 2008 Tech Awards by the Tech Museum of Innovation.

In order to maximize the benefit, the same approach is also applied to agriculture extension work (Digital Green) and the awareness campaign for rural healthcare (Digital Polyclinic). This project is thus a good example of a vehicle towards achieving the Millennium Development Goals and Education for All.

Further information:
• Digital StudyHall (DSH)

Related links:

• Successful streak of “Hole-in-the-Wall” continues
• Low-cost audio computer helps NGO in its development work
• Community Multimedia Centres: Empowering marginalized communities in Nepal
• ICT in Education for Rural Development (iERD) project launched
• Mobile Science Project: Engaging students in science through mobile learning
• Connected Community Learning Centres

Previous issues of the e-newsletter:

• UNESCO "ICT in Education" Announcement e-newsletter

What do you think about this topic?

• Visit our on-line forum and share your views

Resources
Publications by UNESCO Institute for Information Technologies in Education
The UNESCO Institute for Information Technologies in Education (IITE) published six new policy briefs during the past year, in order to disseminate new achievements, teaching methodologies and concepts in the field of ICT in education. One publication that has received special international attention and recognition, deals with different computational techniques for the analysis of learner data, now becoming more and more available to educators and policy makers. Other publications focus on Alternative Models of Education Delivery, ICTs in Global Learning, ICT and General Administration in Educational Institutions as well as on How Technology Can Change Assessment. Here, researcher, policy makers and educators alike, can
find not only evaluative information but also specific and practical recommendations for the use of ICT in the educational work.

**Latest Policy Briefs by IITE:**


Other publications by IITE: [http://iite.unesco.org/publications/](http://iite.unesco.org/publications/)

**Technological Pedagogical Content Knowledge (TPACK) explained**

Technological Pedagogical Content Knowledge (TPACK) attempts to identify the nature of knowledge required by teachers for technology integration in their teaching, while addressing the complex, multifaceted and situated nature of teacher knowledge. The TPACK framework extends Shulman’s idea of Pedagogical Content Knowledge.

At the heart of the TPACK framework, is the complex interplay of three primary forms of knowledge: Content (CK), Pedagogy (PK), and Technology (TK). The TPACK approach goes beyond seeing these three knowledge bases in isolation. The TPACK goes further by emphasizing the new kinds of knowledge that lie at the intersections between them, representing four more knowledge bases teachers applicable to teaching with technology: Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and the intersection of all three circles, Technological Pedagogical Content Knowledge (TPACK).
Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationship between these components of knowledge situated in unique contexts. Individual teachers, grade-level, school-specific factors, demographics, culture, and other factors ensure that every situation is unique, and no single combination of content, technology, and pedagogy will apply for every teacher, every course, or every view of teaching.

- **Content Knowledge (CK)** – “Teachers’ knowledge about the subject matter to be learned or taught. The content to be covered in middle school science or history is different from the content to be covered in an undergraduate course on art appreciation or a graduate seminar on astrophysics… As Shulman (1986) noted, this knowledge would include knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and proof, as well as established practices and approaches toward developing such knowledge” (Koehler & Mishra, 2009).

- **Pedagogical Knowledge (PK)** – “Teachers’ deep knowledge about the processes and practices or methods of teaching and learning. They encompass, among other things, overall educational purposes, values, and aims. This generic form of knowledge applies to understanding how students learn, general classroom management skills, lesson planning, and student assessment.” (Koehler & Mishra, 2009).

- **Technology Knowledge (TK)** – Knowledge about certain ways of thinking about, and working with technology, tools and resources. and working with technology can apply to all technology tools and resources. This includes understanding information technology broadly enough to apply it productively at work and in everyday life, being able to recognize when information technology can assist or impede the achievement of a goal, and being able continually adapt to changes in information technology (Koehler & Mishra, 2009).

- **Pedagogical Content Knowledge (PCK)** – “Consistent with and similar to Shulman’s idea of knowledge of pedagogy that is applicable to the teaching of specific content. Central to Shulman’s conceptualization of PCK is the notion of the transformation of the subject matter for teaching. Specifically, according to Shulman (1986), this transformation occurs as the teacher interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional materials to alternative conceptions and students’ prior knowledge. PCK covers the core business of teaching, learning, curriculum, assessment and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy” (Koehler & Mishra, 2009).

- **Technological Content Knowledge (TCK)** – “An understanding of the manner in which technology and content influence and constrain one another. Teachers need to master more than the subject matter they teach; they must also have a deep understanding of the manner in which the subject matter (or the kinds of representations that can be constructed) can be changed by the application of particular technologies. Teachers need to understand which specific technologies are best suited for addressing subject-matter learning in their domains and how the content dictates or perhaps even changes the technology—or vice versa” (Koehler & Mishra, 2009).
- **Technological Pedagogical Knowledge (TPK)** – “An understanding of how teaching and learning can change when particular technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies” (Koehler & Mishra, 2009).

- **Technological Pedagogical Content Knowledge (TPACK)** – “Underlying truly meaningful and deeply skilled teaching with technology, TPACK is different from knowledge of all three concepts individually. Instead, TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students’ prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones” (Koehler & Mishra, 2009).

**History and Ownership TPACK**
TPACK is not a brand new idea, nor is it owned by anyone. A range of other scholars have argued that that knowledge about technology cannot be treated as context-free, and that good teaching requires an understanding of how technology relates to the pedagogy and content. The TPACK framework is gaining popularity amongst researchers and scholars. This makes tracking the progress of TPACK difficult, but for those getting started, the seminal description of TPACK (by that particular name) can be found in Mishra & Koehler, 2006.

Many people continue to develop the TPACK framework conceptually, theoretically, and empirically. Check out the TPACK Library section for more information.

**Learning More about TPACK**
This document is meant to be a gentle introduction to the TPACK framework, you can learn more by exploring the rest of the tpack.org website, or by clicking on the TPACK Academy section of the site.

**References**


About Matthew Koehler
Dr. Matthew J. Koehler is editor of tpack.org, and authored over 20 publications related to TPACK, including: Mishra & Koehler (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017-1054. No information is provided by the author.

Further information:

- TPACK.org
- Technological Pedagogical Content Knowledge (TPACK) explained

Related links:

- First workshop on effective ICT-pedagogy integration in Pakistan
- Time to move to competency-based continuing professional development

Previous issues of the e-newsletter:

- UNESCO "ICT in Education" Announcement e-newsletter

What do you think about this topic?

- Visit our on-line forum and discuss this topic

First online climate change education course for teachers
The first online learning course on Climate Change for the Secondary Teachers is now available. This innovative training kit, entitled UNESCO Course for Secondary Teachers on Climate Change Education for Sustainable Development (CCESD) is designed to give teachers confidence, through a series of six-day programmes, to help young people understand the causes and consequences of climate change today.
The course aims to bring climate change education outside the science classroom into all subject areas liable to be affected by climate change. These include as ethics, social studies, economics and political science, among many others.

Using a holistic approach, pedagogical approaches and techniques in their own school environment, teachers can develop the capacities to facilitate climate change mitigation, adaptation and disaster risk reduction learning. Teacher education institutions can also use the course to update CCESD content in their pre-service and in-service training programmes through pedagogical frameworks, exercises, regional resources and guidelines.

Users can access to the learning materials through Flash-based software. The Flipbook format provides an on-screen textbook experience along with the functionality of web links to quickly access other pages, or complementary information (e.g. PowerPoint slides).

“There are many exciting grassroots initiatives on education for sustainable development underway across the world,” says UNESCO’s Director-General, Irina Bokova. “Behind each one are engaged young people and teachers, inspired by the spirit of solidarity. Education is a pillar of the future we want to build.”

UNESCO’s Programme on Climate Change Education for Sustainable Development is engaged in building that pillar. In addition, the programme explicitly includes disaster risk reduction in its activities and tools.

Further information:

- First online climate change education course for teachers

Related links:

- “Climate literacy” in the classroom
- Harnessing ICT to enhance Education for Sustainable Development
- ICTs in Education for Sustainable Development
- How Information and Communications Technologies Can Support Education for Sustainable Development: Current uses and trends
- Chinese and French students create extraordinary climate change videos

Previous issues of the e-newsletter:
What do you think about this topic?

- [Visit our on-line forum and discuss this topic](#)

A parent's guide to 21st-century learning
Discover the tools and techniques today's teachers and classrooms are using to prepare students for tomorrow -- and how you can get involved.

What should collaboration, creativity, communication, and critical thinking look like in a modern classroom? How can parents help educators accomplish their goals?

This guide helps bring more parents into the conversation about improving education.

Further information:

- [A parent’s guide to 21st-century learning](#)

Related links:

- [Edmodo – “Where learning happens”](#)
- [Science in the Classroom: In defense of low-tech education](#)
- [The Super Book of Web Tools for Educators](#)

Previous issues of the e-newsletter:

- [UNESCO "ICT in Education" Announcement e-newsletter](#)

What do you think about this topic?

- [Visit our on-line forum and discuss this topic](#)