Separating the Hope from the Hype:

More perspectives on the use of information and communication technologies (ICTs) to benefit education in developing countries

*Excerpts from the World Bank’s EduTech blog (Volume III)*

Michael Trucano
The World Bank
2012
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CONTENTS

Introduction, notes and disclaimers

1. Top World Bank EduTech blog posts of 2011
2. Debating Technology Use in Education
3. What Are the Costs of Not Investing in ICTs in Education?
4. What's happening with educational technology in 2011? A visit to BETT
5. How to identify and locate national ICT and education policies

7. What are developing countries doing to help keep kids safe online?
8. Education & Technology in 2025: A Thought Experiment
9. What role should 'education' play in donor ICT strategies?
10. E-Reading in Africa

11. ICT & Global Education For All: Moving Forward?
12. When students are in charge of maintaining the computers in schools
13. Education & Technology in Africa: Creating Takers ... or Makers?
14. SMS education in Pakistan
15. Crowdsourcing, collaborative learning or cheating?
16. Educational Technology Use in the Caribbean
17. More on SMS use in education in Pakistan
18. What's next for Plan Ceibal in Uruguay?
19. Reporting back from eLearning Africa 2011
20. One-to-one computing in Latin America & the Caribbean
21. What happens when all textbooks are (only) digital? Ask the Koreans!
22. Using ICTs in schools with no electricity
23. Surveying ICT use in education in Brazil
24. Can you really teach someone to read with a computer alone?
25. Running your own FAILfaire
26. e-Learning in Korea in 2011 and beyond
27. School computer labs: A bad idea?
28. The Aakash, India’s $35 (?) Tablet for Education
29. eLearning, Africa, and ... China?
30. eTransform Africa

About the author
Introduction, notes and disclaimers

This electronic publication collects together featured writing from 2011, the third year of the World Bank's EduTech blog, which aims to explore issues related to the use of information and communication technologies to benefit education in developing countries.

These short articles are collected and repurposed here to enable off-line reading of the entire collection, plus access via a variety of new devices (like e-readers and mobile phones), based on requests from readers in developing countries with poor access to the Internet. That said, each blog entry contains multiple links to resources on the Internet, and this collection is best sampled when Internet connectivity is at hand.

The EduTech blog can be accessed directly via http://blogs.worldbank.org/edutech. To be notified when new items are posted, please follow us on Twitter via @WBedutech or subscribe directly to our RSS feed, http://blogs.worldbank.org/edutech/rss.xml. We actively encourage re-posting and re-distribution of the items from the EduTech blog, and make available the blogs content under a Creative Commons Attribution 3.0 Unported (CC BY 3.0) license.

Posts on the EduTech blog are not to be exhaustive in their consideration of a given topic, but rather to point to interesting developments and raise questions of emerging interest. They should not be mistaken for peer-reviewed research or World Bank policy papers. The views expressed on the EduTech blog are those of the author alone, and not those of the World Bank.

At the heart of many blogs – and EduTech is no exception – are comments from readers (and occasional rejoinders from the blog author). As with the two previous annual collections of posts from the World Bank's EduTech blog, all comments on individual posts have been omitted from this collection due to a variety of sourcing rights issues. Readers are invited to visit the blog itself to participate in the often lively discussions around various topics.

Most weeks, the EduTech blog features images that are made available via a variety of Creative Commons licenses for broader re-use. We consciously utilize such images not only because it is easy to do so (although that of course is true as well), but also to highlight the fact that different approaches and mechanisms for the sharing of information and media resources are emerging that may be of special relevance to our counterparts and partners working in the education sector in developing countries. Please let us know if you feel that any of the images reproduced here have been used in ways contrary to such licenses.
1. Top World Bank EduTech blog posts of 2011

by Michael Trucano
Originally published on Friday, 6 January 2012

We have just completed three years of publishing the World Bank's EduTech blog. As we did at the end of 2010 and 2009, we have put together a consolidated list of 'top posts' from the last year. The EduTech blog is meant to provide an informal way to share information about some of the things (projects, challenges, technologies, approaches) that we think might be of interest to a wider audience, especially in so-called "developing countries", hopefully serving in some modest way to promote greater transparency related to some of the sorts of information, conversations and discussions that previously were accessible only to limited groups of stakeholders and partners with whom the World Bank is in regular dialogue.

There is no shortage of blogs that focus on educational technology issues. The vast majority of the ones available in English are written by and for people working in schools and education systems in the United States, Canada, the UK and other places in Europe, Australia, etc. While we are certainly happy when *anyone* reads our short weekly posts, this is decidedly *not* our target audience. (People interested in that sort of thing are directed to the lists of excellent educational technology blogs available [here](#).) On the EduTech blog, our goal each week is to "explore issues related to the use of information and communication technologies to benefit education in developing countries", and it is through this prism that we always try to view things. Most posts are actually extensions of, or complements to, on-going conversations that we are having with various groups about particular projects and, truth be told, we often write a post with an explicit target audience of just a handful of people in mind. That said, we are quite happy that we seem to have found a pretty wide and dedicated weekly readership.

International development institutions are often seen as notoriously traditional and hidebound institutions, especially in their embrace of new technologies, and by publishing (nearly) every week, we hope to demonstrate to various partners within the UN and international development community, as well as our partners in government around the world, that it is possible to share information quickly and
cheaply with interested groups in ways that are a bit more idiosyncratic, and possibly more interesting, than via a press release touting the achievement of some milestone or a dense paper that goes through a lengthy review process before finding a wider audience. Both of those mechanisms obviously have their place. That said, based on personal experience with this blog, I find that the immediacy and wide readership of some blog posts prove useful to advance dialogue on some topics in ways that other 'traditional' publishing mechanisms is less suited to do. (Yes, this may be old news to many readers -- this paragraph isn't directed at you.) Whereas press releases and more formal academic papers often signal the end of a process of some sort, this blog is often used to spark conversation about starting something new, in places where some of the topics or ideas or approaches are not widely known.

So: That's enough preface. Below is a collection of top posts from 2011. There were fewer posts to pick from this year, given that we suspended publication for three months due to other commitments (and from sheer exhaustion -- maintaining the blog remains a largely 'extracurricular' activity), but we hope that you found something of interest and relevance to your work.

Top World Bank EduTech Blog Posts of 2011

10. **Reporting back from eLearning Africa 2011** & **Education & Technology in Africa: Creating Takers ... or Makers?** & **eLearning, Africa, and ... China?** Collectively, these three posts about the use of ICT in education in Africa -- all occasioned by 2011's eLearning Africa event in Tanzania -- were widely re-circulated.

9. **Crowdsourcing, collaborative learning or cheating?**
The introduction of computers often challenges educators, parents, communities and educational systems in ways that are poorly anticipated. This post looked at how the ability to communicate instantaneously, and to cut and paste, highlights some of the issues at the core of what it means to 'educate' someone in the 21st century.

8. **Using ICTs in schools with no electricity**
In many places in the world, the 'digital divide' is as much about access to electricity as it is about access to the Internet and computing resources in general.

extra: **Latin America**
When people ask about where educational technologies are being widely used in 'developing countries', many instinctively look to Asia for answers.
The fast pace of changes and initiatives in Latin America -- like in Uruguay's Plan Ceibal -- is attracting greater interest around the world, and was the subject of many blog posts in 2011, including What's next for Plan Ceibal in Uruguay?, One-to-one computing in Latin America & the Caribbean, Educational Technology Use in the Caribbean and Surveying ICT use in education in Brazil.

7. **The Aakash, India's $35 (?) Tablet for Education**
Interest in a cheap computing device for students shows no sign of abating. The latest gadget to grab headlines is India's Aakash -- this post described a visit to the World Bank by the head of the company that makes it.

6. **Running your own FAILfaire**
No one gets promoted for failing. So why talk about it? And even if you do want to talk about it: How can you do it without getting fired? This post draws on lessons from a number of FAILfaire events that have been held at the World Bank to help share lessons about what hasn't worked in the past, in the hope that this might provide some useful guidance and perspective for people contemplating similar things in the future.

5. **When students are in charge of maintaining the computers in schools**
Few education systems provide sufficient budgets to ensure that computers in schools remain in working order. This post looked at an interesting initiative that enlists the help of students to keep everything running.

extra **What Are the Costs of Not Investing in ICTs in Education?**
Whether one agrees with such a question, it is commonly asked (if not rigorously considered) as an important part of considerations of large-scale investments in ICTs in the education sector in many countries.

4. **What happens when all textbooks are (only) digital? Ask the Koreans! & e-Learning in Korea in 2011 and beyond**
The bold decision by educational leaders in South Korea to introduce digital textbooks in all subjects at all levels by the middle of the decade is being closely watched around the world. This is a topic that we will continue to revisit over time, especially given the close partnership between the World Bank and Korea exploring how best to support the effective and relevant use of ICTs in education in developing countries.

3. **SMS education in Pakistan & More on SMS use in education in Pakistan**
There is much hype about potential uses of mobile phones in education. A lot of this excitement is related to the potential for applications running on high-end smartphones. What about the types of low-end phones most people in the world
actually use? These two posts looked briefly at one World Bank-sponsored initiative in Pakistan.

extra **Education & Technology in 2025: A Thought Experiment**

This short blog post tried to turn a common discussion held at ministries of education about the use of educational technologies on its head, asking *If costs weren't an issue, what would you be seeking to do with technology to support learning? Would this change your perspective on the role of ICTs from what it is now?*

2. **School computer labs: A bad idea?**

Sometimes it is useful to take a step back and ask: Do we need to change some of our fundamental approaches to how and where we consider the use of educational technologies? The concept -- and reality -- of a *computer lab* is central to the use of new technologies in most schools in developing countries. Should it be? This short post ignited a lot of discussion in a number of places.

1. **Mobile learning in developing countries in 2011: What's new, what's next?**

As in past years, the topic of mobile phone use in education continued to draw lots of readers to the EduTech blog. Will 2012 finally be the year where this topic breaks into the mainstream in some new places?

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While blog posts are often meant by their very nature to be rather ephemeral, a number of EduTech posts from earlier years enjoyed strong readership in 2011, including *Worst practice in ICT use in education*, *10 Global Trends in ICT and Education*, and pretty much anything about *mobile phones*. The lists of top posts from 2009 and 2010 may also be of interest. An easy way to be informed of new posts on the EduTech blog is to follow us on Twitter [@WBedutech](https://twitter.com/WBedutech) and/or to subscribe to our RSS feed (we put the complete text in the feed, to make it easy to read off-line and/or to re-publish on other sites).

Finally, an end-of-year "shout-out" to our sister site, the Educational Technology Debate, which continues to spark interesting discussion through regular contributions from a wide variety of people from different backgrounds; the main World Bank education sector blog (where EduTech items are occasionally cross-posted) and IC4D blog (not sure where the "T" got lost); and a general thank you to a number of international development-themed blogs, from one-man-shows to collective endeavors of various sorts, from which I continue to draw inspiration, and
which regularly provoke me to think about things I often don't think about it -- or which challenge me to about things I do think about but in different ways. Happy New Year!

Note: The image used at the top of this blog post of the celebration of the 750th anniversary of the founding of Berlin ("lots of people celebrating another happy birthday") comes from the German Federal Archive via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Germany license. (Bundesarchiv, Bild 183-1987-0704-015 / Schindler, Karl-Heinz / CC-BY-SA)
2. Debating Technology Use in Education

by Michael Trucano
Originally published on Friday, 7 January 2011

Initially conceived by a diverse set of partner organizations during one of the follow-up meetings to the World Summit on the Information Society (WSIS) as a way to continue in public a number of ongoing discussions that were largely occurring in private, since 2009 infoDev's EduTech Debate web site has featured contributions from an eclectic mix of experts and practitioners on a variety of topics related to the uses of ICTs in education, especially as they relate to developing countries. Drawing inspiration from an online debate sponsored by the Economist in late 2007, the ETD site has featured disagreements (and occasional agreements) on around themes like impact assessment, gender, sustainability and a variety of specific technology tools.

Re-visiting some of the issues explored in that Economist debate, in 2011 the EduTech Debate site kicks off by hosting a high level discussion around the question, Are ICT investments in schools an education revolution or fool's errand?

From the time of Plato, educators have struggled with the acquisition of knowledge, seeking it to be understood by the learner versus just assimilated as dogma. Since Plato's time, educational technology - from the written word to the printed book to the chalkboard - has been hailed as the solution to this challenge. Each successive technology had impact, though often not what the introducer hoped.

Now we come to the digital age, where electronic information and communication technologies (ICT) are the newest promise to empower learners to understand and interact with society. Radio, TV, and now computers and the Internet are profoundly changing civilization, as we know it. Can they have the same impact on education?

Will ICT create a revolution in education, as The Children's Machine predicts, where the learner is central and knowledge is created and understood with guidance from fellow learners and adult facilitators? Or is ICT use in
education really a fools' errand, yet another fad that will waste resources, creating *The Flickering Mind* and leaving educational systems no better than before?

A fantastic line-up of contributors has been assembled to begin the new year:

- **Cristobal Cobo** is a research fellow at Oxford Internet Institute at the University of Oxford and a coordinator of a collective project on informal, non-formal and invisible learning, as discussed in the TEDx talk *Invisible learning: How to learn beyond the school?* He also blogs [here](#).

- **Larry Cuban** is a former high school social studies teacher, district superintendent, and university professor. Larry is a prodigious and influential author on the history of the use of technology in education in the United States (among other topics), including *Oversold and Underused*, a critical look at the use (and non-use) of computers by teachers and students. He also blogs at [Larry Cuban on School Reform and Classroom Practice](#).

- **Lowell Monke** is assistant professor of Education at Wittenberg University. Lowell researches and writes on the social and psychological impact of high technology on children’s development, including (with the late and dearly missed R.W. Burniske) *Breaking Down the Digital Walls: Learning to Teach in a Post-Modem World*.

- **Kentaro Toyama** is a researcher in the School of Information at the University of California, Berkeley; he was previously the assistant managing director of Microsoft Research India in Bangalore. Kentaro was recently featured in the *Can Technology End Poverty?* debate that inspired this month’s ETD. Those who enjoy his writings may also enjoy the blog of the ICT4D Jester.

- **Claudia Urrea** is a visiting research scientist at the MIT – Media Lab. Claudia's PhD thesis focuses on the creation of new learning environments for the digital era and she collaborates with OLPC in the worldwide deployment of revolutionary learning tools to children in the developing world.

Kentaro Toyama has kicked off the debate with a thought-provoking post, *There Are No Technology Shortcuts to Good Education* (in which he lists what he considers to be "9 Myths of Technology in Education").

Please feel free to join in the debate as well -- everyone is welcome.
In case you missed them (and extending the 'best of blog' theme of the recent entry detailing the Top World Bank EduTech blog posts of 2010), here are some quick links to last year's EduTech Debates, which were moderated by Wayan Vota:

**EduTech Debates 2010**
- **January 2010**: 2010 ICT4E Trends
- **February 2010**: Assistive Technology
- **March 2010**: eLearning Promise
- **April 2010**: ICT Tools for South Asia
- **May 2010**: Is ICT in Schools Wasted?
- **June 2010**: Low-Cost ICT Devices
- **July 2010**: Educational ICT at Home
- **August 2010**: Literacies: Old and New
- **September 2010**: mEducation Initiatives
- **October 2010**: Games and Education
- **November 2010**: OLPC in South America
- **December 2010**: Computer Configurations for Learning

Some of the notable contributors to ETD over the past year included Oscar Becerra, Mark Beckford, Fernando Botelho, Nick Carr, Christoph Derndorfer, Atanu Dey, Inés Dussel, Bob Hawkins, Tim Kelly, Derek Lomas, Cavin Mugarura, Miguel Nussbaum, Ian Thomson, Steve Vosloo, Marion Walton, Mark Warschauer, Seth Weinberger and Clare Woodward.

Please note: The image used at the top of this blog post of Debate Square, the site of the second debate between Abraham Loncoln and Stephen Douglas in Freeport, Illinois (USA) as part of their campaigns for a seat in the U.S. Senate in 1858 ("finding a place to air one's views") comes courtesy of Ivo Shandor via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
Kentaro Toyama has started 2011 off 'with a bang' on our sister Education Technology Debate site, which is sponsored by our friends at infoDev and UNESCO.

There is much to comment on in Kentaro's post, 'There Are No Technology Shortcuts to Good Education' -- to say nothing of the insights and assertions in the 100+ comments that follow it, many of them from people who are quite well known in the field. Subsequent contributions on the ETD site from Larry Cuban, Cristobal Cobo, Claudia Urrea and Lowell Monke should provide further grist for debate and discussion.

Kentaro lays out a number of arguments in his piece. One of them is the following:

"I’ve so far argued that technology in education has a poor historical record; that computers in schools typically fail to have positive impact (with the rare exceptions occurring only in the context of competent, well-funded schools); that information technology is almost never worth its opportunity cost; and that quality education doesn’t require information technology."

My aim here is not to contest (or support) any of the assertions in Kentaro's piece (I'd recommend you look in the comments section of the ETD site for this sort of thing). Rather, it is to note that, in many instances, Kentaro's assumptions about what drives policy may well be beside the point.

In a recent blog post on Education Week's Bridging Differences blog, Diane Ravitch laments that too many economists are mixing themselves into discussions about education policy for which they are ill-suited, including those around pedagogy. Point well taken. That said, on the flip side, it is probably also true that many (if not most) educators have only a very loose grasp of the economics of education.
With this in mind, Kentaro's discussion of total costs of ownership, and of opportunity costs -- topics that are regrettably absent from many of the discussions around large scale investments in the use of educational technologies -- is quite welcome. Discussions of costs are, perhaps not surprisingly, near and dear to us at the World Bank, so I'll limit my modest contribution to this month's Educational Technology Debate by considering only the cost issue, but with a twist.

In many instances, it is not only the costs of action that dominate discussions at a high level, but rather considerations of the potential opportunity costs of inaction. In informal conversations with education ministers at both last week's Education World Forum, and at the World Innovation Summit for Education (WISE) in Doha in December, I heard the same question asked that I have heard dozens of times before from people in such positions:

What are the costs of not investing in ICT use in education?
Can we afford them?

Whether one agrees with the utility of such questions or not, they are commonly asked (if not rigorously considered) as an important part of considerations of large-scale investments in ICTs in the education sector in many countries.

Indeed: It is not only (to name just three examples) a love of novelty or gadgetry, or desires for ICT-enabled pedagogical reform, or motivations to sell products and services to schools, that animates related decisions in many places. Nor is it a robust evidence base: I won't try to contend that, at the macro- or system level, policymaking related to technology use in education is 'evidence-based'. With very (very!) few exceptions, it largely isn't. (Anticipating strong pushback from some teachers, I note that this differs from what happens at the classroom or 'micro-' level, where a pragmatic teacher makes due with what she has, and whose craft is informed as much by the lessons of years of trial-and-error as it is by any 'grand theory of education' -- although in practice the pedagogical traditions in which teachers themselves were educated perhaps play as fundamental a role.)

All of these (and others) of course play their part in discussions around funding initiatives in this area. That said, there is a motivating factor that I hear voiced by many policymakers with responsibility in this area: fear. Now, fear is perhaps not always an inappropriate or ill-advised motivator, but it is quite often not the best one. I am not sure if fear qualifies as one of the reasons 'Why Sloppy Thinking Leads to Careless Educational ICT', a topic Larry Cuban discusses in his follow-up to Kentaro's post, but in my experience it is one of the key animators behind the 'leap of faith' that characterize some of the biggest investments in educational technologies in developing countries.
(Too clever? Playing on language often employed in policy circles in the United States, and lamenting the lack of clear direction that a compelling evidence base might provide, colleagues at one national education ministry used to quip that large-scale investments in ICT use in education are in some ways the real faith-based initiatives.)

As countries (rightly or wrongly) increasingly view themselves as global competitors to each other, what role do schools have in preparing young people to successfully navigate an increasingly technology-rich world? This is a topic that Lowell Monke takes up in his contribution to this month's ETD debate, *High Tech Society Requires a High Touch Childhood*. In many places, investments in ICTs in education are justified by people who adopt various 'digital divide' arguments (with perhaps a glimpse or two at the latest PISA tables). Now, one can argue what exactly what this 'divide' represents in 2011 in different places around the world, but I think that most people would agree that, if this concept is still to remain relevant, we are talking about much more than 'access', as the OECD noted last year in a report that concluded that "A second digital divide separates those with the competencies and skills to benefit from computer use from those without."

Many of the proposals to address such gaps draw on the 'leapfrogging' metaphor that is a staple of much discourse around the potential for ICT use in developing countries. (I don't often hear people consider that it is possible to leap in the wrong direction, potentially ending off in a worse place than where you started, but I suppose that is another issue.) In such cases, schools are useful vectors to help transform societies through the introduction of various ICTs. One hears echoes of this sort of thing in Uruguay, for example, where they talk about the fact that every primary school child now having a free laptop is not the result of a 'laptop project', or even an 'education project', but rather a society-wide 'inclusion project'.

We may often like to hope that key decisions related to the use and potential of ICTs in education are based on dispassionate and rigorous scientific analysis, while conceding that cold political calculus (e.g. politicians cutting ribbons at school computer labs) may often play a more decisive role. *Fear -- and faith -- may well play equally important roles.* How well we harness such fears, and tap into the aspirational components of such faith, is the challenge before those of us in the education community who believe in the potentially transformative power of technologies for learners while at the same time lamenting the way such technologies are typically used in schools.
Note: The image used at the top of this blog post of a pair of jeans ("empty pockets?") comes from Dvortygirl via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
4. What's happening with educational technology in 2011? A visit to BETT

by Michael Trucano
Originally published on Thursday, 27 January 2011

The annual BETT Show, which takes place every January in London, claims to be the "world's largest education technology exhibition and trade show", with over 600 exhibitors and 100 seminars. Those who visit it are typically overwhelmed by the vast scale of the exhibition space at London-Olympia, by the big crowds, and, for lack of a better term, all of the cool stuff. As in past years, I was fortunate to be able to participate in the Education World Forum (EWF), an annual gathering of 60+ education ministers that occurs during the two days before BETT begins (the last morning of the Forum actually takes place at BETT itself), and so was able to stay on and tour the BETT exhibition space. As in previous years, my goal was to visit every vendor and exhibitor.

In case it might be of any interest, and like I did back in 2009, I thought I would share some random impressions (ten of them, in fact) from this tour below:

1. It should probably go without saying, but I'll say it anyway: It is obvious that educational technology is increasingly big business. This is true not only in developed economies like the UK, but, judging by the number of international visitors and delegates in attendance, in many so-called 'middle income' countries as well. Given the dizzying variety of equipment and gadgets on display at BETT, as well as applications to run on and monitor this equipment, there appear to be few parts of existing school infrastructures, and of the teaching, learning and administrative activities of schools, that are not being targeted for transformation by companies of all shapes and sizes. 45 product categories, from assessment products to microelectronics, robotics to learning platforms, behavior management to networking to furniture -- one gets the impression that schools (at least in the UK) are slowing on the path to becoming as saturated with technology as the rest...
of society. (What impact all of this will have on student learning is another question entirely, of course.)

I spent much of my time at BETT tagging along with government delegations from developing countries to get a better sense of what they are interested in, what types of questions they have, and how companies are marketing to them. In most of these places, the use of 'computers' is limited to what is known as the 'computer lab'. Coming from this perspective and experience, BETT can be particularly overwhelming for some first time visitors. "It's like the whole school is becoming one big computer with lots of little parts", one delegate from Africa remarked to me.

2. The most interesting stuff is often to be found at the 'little booths'. Perhaps because the big vendors have little trouble getting out their marketing messages, and because information on so many products is easily findable online (and because I am deluged with marketing information throughout the year from 'the big boys'), I spent comparatively little time at the large exhibition spaces in the middle of the two halls. Instead, I spent most of my time talking to people at the small stands away from the main floor. This usually meant I had the benefit of speaking with someone who actually built the product being exhibited, and/or ran the company, instead of a straight marketing person. Some interesting things I saw (as is my normal practice, I'll do my best omit the names of individual products and companies, except where doing so is unavoidable, so as to avoid giving the impression that the World Bank 'endorses' any particular commercial product or service, and in the hope that doing so will lessen the unsolicited blogspam and emails I get from vendors touting their wares):

- inexpensive visual software tools to enable students to design video games themselves
- an application that takes data from mobile dataloggers and projects it using Google Maps into specific places (one demo I saw enabled students to track the path of a javelin, with the path of the projectile through the air then mapped onto the streets of a mid-size English city)
- tools to allow students to create stop-action video using their mobile phones
- charging carts for mobile devices (an extensive of the computer-on-wheels concept)
- an interactive whiteboard that included no whiteboard

While on that topic ...
3. The interactive whiteboard space is getting very interesting. One defining feature of BETT over the years has been the prominence of interactive whiteboards (IWBs). Indeed, it was in the UK that IWBs first saw broad adoption, a path that many other countries (including many middle income and some lower income countries) are now seeking to replicate, for better or for worse. To me, the most interesting thing about interactive whiteboards themselves has not been the fact that they allow users to manipulate projected objects through touch or hand gestures, but rather the fact that they often came bundled with interactive response devices. (For those not familiar with them, they are essentially handheld voting machines that teachers can use to quiz students and assess what they know in formative ways, with the results displayed on the whiteboard at the front of the class.)

For many (traditional) school leaders, and for many (tradition-minded) teachers, a key selling point of whiteboards has been the fact that it is easy to envision how they can be used in classroom settings. Most teachers lecture, many use PowerPoint -- wouldn't it be cool if we could add some bells and whistles to this? At the same time, with many schools in OECD markets already boasting long-standing computer labs and increasingly equipping individual classrooms with a computer for use by teachers, the looming presence of a new interactive whiteboard at the front of the room provides further evidence of just how 'tech-savvy' an individual school is (and, by extension, how 'visionary' the responsible education officials are for staying at the edge of the technology adoption curve). The fact that IWBs are attractive for many people precisely because they reinforce traditional teacher-centered pedagogical practices has been widely lamented. At the same time, however, the increasing inventiveness with which the small interactive response devices can be used to help teachers gauge how much individual students are understanding during the course of a particular instructional hour does hint at the potential for something wonderfully disruptive to occur in traditional classroom settings. Critics of the use of education technologies in schools (and critics of IWBs in particular) may pooh-pooh this sort of 'Trojan Horse argument' as naive, or an example of successful marketing by vendors to the gullible. They may also argue that there are much more cost effective ways to introduce 'interactivity' into the classroom. Fair enough. This isn't to say, however, that there aren't very interesting things happening as a result of the use of these small gadgets.

That said, I do wonder if this whole market segment is not about to be greatly disrupted. The proprietary interactive voting devices offered by some firms would seem ripe for replacement by apps running on already existing hardware like mobile phones (or other handheld devices like iPod Touches, and presumably soon a variety of Android devices). Additionally, I saw a lot of IWB vendors at BETT that I had never seen before, and one expects price competition from new companies
(especially from Asia) to be intense. At the stand for the Sankoré initiative (a topic for another blog post), I also saw open source IWB software for the first time. What this may mean for this market, I don't know, but one hopes that these competitive forces will be a spur to innovation. Many middle income and developing country delegations that I followed around at BETT were explicitly interested in interactive whiteboards; my impression was that many of these folks left the exhibition both excited and confused.

4. From country-specific to global educational technology markets. While I haven't seen the figures, this year's event seemed to me to be the most 'international'. The large multinational players in this space of course had large presences at the event. But many medium- and small-sized companies from outside the UK and the USA were notable by their presence as well, and (for example) firms from Scandinavia, Brazil, Turkey, Singapore, China, or the Netherlands were very easy to spot. It appeared that many of them had grown reasonably large (and presumably, reasonably profitable) in their home markets and are now looking to expand into new education markets where opportunities may exist. For World Bank client countries, this impression (if it is indeed valid) reinforces the notion that innovative ICT products and services are springing up all over, and those who look only to 'traditional' places like the UK or USA or Korea may be missing some real opportunities.

5. Augmented reality is part of the conversation, but it is still very early days. It is clear that the use of so-called augmented reality in education has very promising potential applications, but, based on the products I saw at BETT this year, we still have a ways to go before these have the potential to become mainstream in education. It is coming, but perhaps not as quickly as predicted in places like the Horizon Report.

6. Much talk of the cloud. Perhaps a sign that the hype about cloud computing in education is beginning to have an impact on school ICT purchasing decisions in the UK (presumably this would apply to many other places with good and widespread broadband connectivity), many more vendors featured educational applications that were meant to run 'in the cloud' (i.e. over the Internet) than was previously the case. This is not to say that individual applications running on individual computers were not in evidence -- they still made up the majority of software on display at BETT -- but it appears that tide is now starting to shift.

7. Mobile phones? One topic impressed me by its absence. Where was all of the mobile (phone) learning? some colleagues asked me. I had the same question, and this will be the topic of my next post.
8. Where's the computer? As is the case with increasing number of consumer appliances and products (including toys), a visit to BETT reinforces the notion that the use of computers in schools is about much more than what happens in the computer lab. Indeed, the fact that small computers are being incorporated more and more into other types of learning products, and that these products are increasingly connected to each other, will continue to challenge conceptions of what 'ICT use in education' may mean for schools. I spoke with one person in charge of an IT-specific budget for a school in the UK who said that she was increasingly confused about what constituted fair use of dedicated 'ICT funds', given that the lines between what an ICT learning device and a normal 'tool for learning' were becoming, in her words, "dauntingly fuzzy". (For what it's worth, as an educator she seemed rather delighted by this budgetary dilemma.)

9. The science lab is connected -- and mobile
A great variety of equipment meant to be used as part of scientific investigations and experiments was in evidence, as it as in past years. While five years ago at BETT it was noteworthy that increasing numbers of such devices (probeware or dataloggers comprise one common category of such equipment) had USB ports to help share data, in 2011 the fact that increasing numbers of such devices are wifi-enabled surely points to where this category of electronic learning aids is headed.

10. Games, games and more games
Perhaps fearing a backlash from educators and parents, many large, traditional videogame companies do not actively market their products to schools (even if many of them do at the same time offer many 'educational' applications for use in homes). For the first time at BETT, I noticed a little less reticence on this regard. I suspect, for example, that a stand touting the use of the Sony Playstation 3 in education -- rather an outlier at this year's BETT -- will be joined by many other stands in the years to come. There was buzz about what things like Microsoft's xBox Kinect product might mean for education, even if no educational applications using this cool motion-capture technology were in evidence. While there weren't that many of them, it was hard to miss the booths touting various serious games (a category into which I suppose the World Bank-sponsored EVOKE best fits). Many educational applications and on-line learning environments displaced at BETT owed clear debts to video games designs and sensibilities -- when they were not structured as games themselves.

This is just a small sampling of what made an impression on me. A quick search of the Internet should yield other accounts of what people saw at BETT as well.

Note: The public domain image used at the top of this blog post ("a new take on the traditional London phone booth") comes courtesy of Wikimedia Commons.
5. How to identify and locate national ICT and education policies

by Michael Trucano
Originally published on Tuesday, 1 February 2011

As part of our advisory work here at the World Bank on ICT and education topics, we are often asked not only for advice, perspectives and information, but also for strategies on locating various types of information.

For example, we often get asked by countries for examples of 'ICT and education policies' to help inform their own planning processes in this area. We get this request so often that we have decided to (more) systematically document and catalog these sorts of policy documents in the coming months, with the assistance of some of our partner organizations, and make them widely available as part of a global ICT/education policy database. We'll provide periodic updates on this work on this blog.

Until then, and it case it might be useful to anyone looking for such things, we thought we'd post some thoughts on how others might locate and retrieve these sorts of documents themselves, as we have done previously for topics like Tracking ICT use in education across Africa and Finding (useful) research on ICT use in education in developing countries.

1. Search

If you are looking for policy documents from a specific country, your best first step in 2011 is usually to use Google (or Bing or Baidu or [insert favorite search tool here] -- we are quite open in our choices of search engines). Vary your search terms (and be sure to search for words in multiple languages) and you may be surprised at just how successful you are. In this area, a notable number of policy documents are available in English translation, so it is always worth searching for English versions, but online translation tools should help with making sense of policy documents in languages you don't read.

2. Different types of policies in different places
It is important to note that policies that touch on issues related to 'ICT use in education' actually take many forms. Some places have formal, official, 'national ICT/education policies'. In other places, the operative policy is to be found as a the 'ICT' component of an education policy, or conversely in the 'education' component of a national ICT (or its equivalent, e.g. ICT4D, IT, e-society, etc.) policy or some related field (like workforce development). Some places have specific policies for certain sub-sectors -- a common one is a 'policy on ICTs in higher education'. Often times, to the extent that there is a 'policy' in this area, is it actually to be found by cobbling together information from policies in many of these areas (it should be noted that these sometimes conflict).

3. What's old may be new to others (and what's in 'draft' may be the de facto policy)

We also note that a policy developed by country X in 2001 may be relevant to country Z in 2011, both as a marker for historical policy development over time, and because the context of country X in 2001 may more closely correspond to the context of country Z in 2011 than whatever policy is in place in country X in 2011.

In some countries, 'draft' ICT/education policies are widely circulated and function as de facto policies themselves. There are many reasons for this, but one common explanation is that policies in this area need to change quickly, and the process for formally ratifying policies of this sort through existing, formal channels may be so slow and cumbersome that the groups in charge of implementation don’t have time to wait. Sometimes de facto policies do not take the shape that one assumes -- I know of at least one place where, in practice, the policy is actually a PowerPoint file that is regularly shown by the Minister!

4. Start with those who have already collected lots of policy documents

Currently, the most complete list of policy documents in this area is maintained by GeSCI. If you want pointers to lots of policies, I would definitely recommend starting with the GeSCI list [link is to PDF]. As part of its work related to the policy planning process in India, GeSCI archived some policy documents from multiple countries on the web.

In the Asia-Pacific region, the ICT/education policy section of the UNESCO-Bangkok site is your best first point of call. In Europe, the Insight knowledgebase maintained by the European Schoolnet is probably the best place to start.

5. Resources that can provide useful clues and pointers to policy documents
It is often profitable to begin by first looking for documents that identify the names of individual policies (you can then search for them). The country reports contained in the regional surveys of ICT and education in Africa, the Caribbean and South Asia sponsored by infoDev are often quite useful in this regard. (Most of the resources listed in a similar regional survey for Asia published many years ago by UNESCO-Bangkok are linked to from the UNESCO site mentioned in #4 above).

Other useful regard are the web sites of Comminit (especially good for national ICT4D policies, many of which contain ICT components), Eldis and the the e-learning section of the Zunia portal.

6. Ministry of education web sites

In a perfect world, ministry of education web sites themselves should be the first place to look for the policy of a given country. While these should be consulted, attempting to navigate them can often be exercise in frustration. Where links to policies on MOE web sites are broken, you might want to consider using the Internet Archive’s Wayback Machine.

7. The old fashioned route -- read a book

In some cases -- presumably because people with ICT skills and sensibilities are involved in producing them -- ICT/education policies may exist on the Internet in electronic formats, but related larger education policies may not. Even in 2011, not everything is online. If you can locate a copy, Cross-National Information and Communication Technology Policies and Practices in Education is a great source of information about individual country policies; while focused on OECD countries, some middle income countries are included as well.

8. Personal appeal

Here at the World Bank, we benefit from having close working relationships with many governments, and this makes it easier (although, it should be noted, not always easy!) to locate existing policy documents, as we can just call or write someone and ask for copies. For what it’s worth: Given the state of document management in some places, we sometimes find that consultants, NGOs or donor groups involved in the policy drafting process are better able to help quickly locate the documents in question than trying to navigate government bureaucracies to find the latest version of a document.

If you have any other good sources or strategies for locating these types of documents, please feel free to list them in the comments section below.
Note: The public domain image used at the top of this blog post comes via Wikimedia Commons.
After finding out that I had visited the recent BETT show in London (billed as the world's largest educational technology trade show -- previous post here), a number of people who also attended asked me versions of the same query:

**Where was all of the mobile (phone) learning?**

To be honest, I had the same question. Smart phones were seemingly everywhere in the hands of visitors to the show (including those of government delegations from developing countries touring the exhibition spaces), and iPads were certainly not-uncommon sights, but if you were looking for tools meant to incorporate mobile phones* into the learning process, you had to look pretty hard.

[*An aside: For the sake of convenience, I'll call any digital device that you hold in your hand that can be used for learning a 'mobile phone' if it 'looks like a phone'. I am, for example, typing this on an iPod Touch -- not a 'phone' per se (even if I can call my mother with it using Skype), but for my purposes here, I am considering it one.]

This is not to say that educational 'apps' running on handheld devices were not in evidence at all -- they certainly were, but only in small pockets (the most interesting ones I saw were for language learning; more on that topic in a later post). That said, if exposure at the BETT Show is any harbinger of what is coming for 2011, we are still more than a little way off from seeing the mobile phone beginning to realize much of the hype that has been slowly building for a half dozen years or so around its potential as a learning tool. (This is hype that some of us at the World Bank have not been immune to; see, for example, [here](#).) The most interesting demos of the use of mobile phones for learning purposes that I saw at
BETT occurred in small clusters of people who were informally surfing on YouTube for demos or showing off what was on their own personal devices.

The location of the event itself may have played a part in this -- despite an increasing (and increasingly visible) presence of foreign vendors and foreign visitors, BETT still feels largely a UK affair. While there are pockets of very interesting activities, and some UK academics are establishing themselves as leading thinkers and researchers in this area (as evidenced by articles like this [pdf]), many schools in the UK have an uneasy relationship with mobile phones, with the focus of many school administrators often more on the potentially disruptive or 'non-productive' uses of such gadgets than on their potential for learning. (In this, of course, the hesitancy or skepticism of school administrators in the UK mirrors that of their counterparts in many other parts of the world.) There are other plausible explanations as well:

- much of the marketplace for education applications on phones is occupied by small, geographically dispersed developers -- and these folks don't yet see participation at large trade shows BETT as a cost effective use of very limited marketing budgets
- where mobile apps were shown stands at BETT, they may have had difficulty competing for attention; applications running on small screens have difficulty standing out in such environments
- the successful introduction of the iPad, and the impending proliferation of Android-based alternatives, has led many developers who would have written apps exclusively for phones to develop educational applications for the tablet form factor
- the use and potential impact of mobile phones for learning is most likely to be realized in informal learning activities that take place outside of formal school settings, but vendors at BETT are more geared toward the formal schooling sector
- given the many other technology options available to them, perhaps there simply isn't a lot of interest or demand from teachers to explore the use of mobile phones*

*and/or

- it is still too soon -- we have to wait for smartphones to be more prevalent (while it is true that sales of smartphones began to outstrip sales of PCs in the fourth quarter of 2010 and the growth of smartphones within the overall
mobile market is quite strong, in absolute terms they still are still only one-quarter of the overall mobile phone market in places like the United States).

*Saying informally with teachers attending BETT, I found very few who were thinking about exploring the use of phones as part of their teaching. Now, I certainly don't pretend that the views of 20-odd teachers I spoke with informally at BETT are in any way representative of, well, anything. That said, I did recall these conversations when when reading a recent report (*Deepening Commitment: teachers Increasingly Rely on Media and Technology* [pdf]) on what teachers in the United States consider to be the 'portable technologies with the greatest education potential', which placed cell phones at the bottom of the list of devices surveyed, even below things like 'game devices (e.g. Nintendo DS)'.

There is probably some truth in all of these potential explanations (there are numerous other plausible ones as well, but I'll stop now) -- as well as the observation that, whatever the case today, such reasons may not hold come 2012. And of course what is true for the UK (or USA) may not be true for other parts of the world -- especially (potentially?) for developing countries, where teachers do not have access to the wide variety of ICT devices that their professional peers in richer countries like those in Europe and North America do.

If you are looking for insights into where the use of mobile phones in education may be headed, and what some of the related issues might be, and didn't find what you were looking for in this regard at BETT, you may wish to have a look at two very useful reports published at the end of 2010.

**Learning: Is there an app for that?** looks at the current use of mobile phones by children for learning purposes in the United States. Published by the Joan Cooney Ganz Center at Sesame Workshop, it examines new trends in smart mobile devices (with particular attention to the so-called 'pass-back effect', when for example a harried mother navigating her car through traffic passes her iPhone to her daughter in the backseat so that both of them can devote their attention in useful directions); investigates the uses of mobile devices for learning by pre-school children; and then discusses what the implications of all of this might be for companies, educators and researchers.

Some people may ask what relevance findings in this regard from a 'rich' country like the United States to environments where mobile phone use is growing most rapidly -- in developing countries around the world. While many of the insights in the Cooney Center report would appear to be generally applicable (read the report
itself to find out what they are, you'll find much useful stuff), this is a legitimate question to ask. While it does not speak to this directly, the report does note that Technologies designed for learning — particularly in informal environments — risk the unintended consequence of widening the digital divide when only a minority of the population has access. However, market trends suggest that smart mobile devices will be available to all socio-economic status (SES) groups in the near future. For this reason, all three studies included a significant low SES sample. Interestingly, no distinct differences were detected regarding lower-income parents’ reports of children’s behaviors, attitudes, and beliefs. In the long term, these studies indicate that one key issue for policymakers and industry is not whether lower-income and minority demographics would like to use such devices; it is whether they will have access to their educational potential.

By way of contrast, the GSMA's mLearning: A Platform for Educational Opportunities at the Base of the Pyramid explicitly considers developing country environments and markets -- the places where many of the challenges confronting the education sector are the most acute, and where the growth in the use of mobile phones has been phenomenal. While noting that "There has been no major, large scale project that has exposed mLearning into the mainstream market" and that "Funding is a major issue here, with much of the backing going behind good projects that are not sustainable", it includes many one-page profiles of most of the well-known 'm-learning' initiatives in developing country environments (one interesting project not included -- probably for reasons of space, as this is a pretty comprehensive survey -- is m4girls). Usefully, the report explicitly considers things from a mobile operator perspective, as part of a larger 'mobile ecosystem'.

Taken together, both reports mine the territory originally meant to be covered in a planned report from the World Bank that has been on hold for awhile for a variety of reasons. We are, it should be noted, doing a great deal of analytical work looking at mobile applications in areas like access to finance, agriculture and health. Not (yet) in education, however. When we first proposed some mobile education-related work two years ago, there was a general feeling that wasn't a lot of policy-relevant research work being done of relevance to educational decisionmakers in developing countries. We were able to justify funding research into this area by citing the example of the early work done by infoDev on m-banking, which was some of the first analytical work on a topic that has since exploded. Reading these two excellent papers, and knowing of lots of other work that is on-going, I am left wondering:
What else can we at the World Bank add to the discussion at this point? Given that this topic is now being considered to be 'part of the conversation' by other development organizations, what useful role might a donor agency like the World Bank play by sponsoring analytical work related to the use of mobile phones in education in early 2011, as this research topic now appears to have good traction in many quarters and the need for 'catalytic' research (as was the case with the m-banking work) may have passed? Or has it? After all, this topic does not yet appear to be 'mainstream enough' to (for example) compete successfully against other pressing research priorities within the World Bank's 'normal' funding envelopes in the education sector.

Since Mohamed Ally's useful general survey on Mobile Learning was published in early 2009, what has been happening 'on-the-ground' in developing countries -- to the extent that anything substantial is happening -- has been increasingly well documented. In addition to the GSMA paper, the work of researchers in South Africa has been particularly notable, as has knowledge sharing by groups like MobileActive; the annual mLearn conference gains in stature each year; and academic interest is demonstrated through the establishment of new journals like the International Journal of Mobile and Blended Learning. (For what it's worth, this is a topic we will continue to cover semi-regularly on this blog too.)

So: Where do things stand in early 2011? While there have been some high profile early initiatives, some interesting research work has been done, and lots of people are poised to try to learn from any new initiatives that do emerge, few would argue that we are starting to realize the 'revolutionary potential' that many have been predicting for mobile phones in education. Many developers with whom I have spoken are reluctant to devote their energies (for example) to create and pilot educational applications that run on low end phones, or even on so-called 'feature phones', for they feel such products and services will have a limited shelf life, as 'eventually everyone will have a smart phone anyway'. (I hear the same sentiment from many potential funders of activities in this area, both within development agencies and in philanthropies.) Indeed, 'eventually' this may be true (and by that time, many target populations may have access to low cost tablets, iPad alternatives for consumers in emerging markets running on Armdroid). But for hundreds of millions of people around the world, 'eventually' may be a long time coming.

So perhaps it is indeed simply too soon to be talking about the use of mobile phones in education at any significant scale, for a variety of very understandable reasons. That said, even as these barriers to adoption fade, and as more entrepreneurs and entrepreneurial organizations explore innovative approaches and applications over time, a more intractable one may need to be confronted. After
all, unlike the technology sector, which seems in a state of almost constant change, the field of formal education moves sloooowly ....
7. What are developing countries doing to help keep kids safe online?

by Michael Trucano
Originally published on Friday, 18 February 2011

While computers and other ICT tools offer much potential to impact learning, teaching, and educational service delivery in beneficial ways, the use of such technologies also carries with it a variety of risks -- especially for children. While most people are familiar with attention-grabbing headlines related to pornography, sexual harrassment, illegal downloading and 'inappropriate' or political speech, these are only a few of the issues related to keeping kids safe online. In some places, for example, cyberbullying appears to be a more pervasive day-to-day threat for many students, and people are also increasingly understanding potential 'threats' to children related to things like privacy and data security.

To date, most of the internationally comparative work on issues related to child digital safety has taken place in 'developed' OECD countries, and the documentation and analysis of these risks in developing country environments, and their related policy responses, is largely unstudied. As noted in a recent publication from the Berkman Center at Harvard University and UNICEF,

"One of the next steps should identifying the problems children in developing nations are facing and map these issues in the respective technological, social, and economic context; from there, we will be better equipped to develop tangible, accessible targeted solutions and resources."

Absent such work (and as has been discussed on a previous EduTech blog post on this topic), there is a potential for child digital policies and practices based on experiences from Europe and North America to be taken as de facto models for circumstances and actions in other places (this of course may not be a good thing).
Building on the Berkman-UNICEF work, the World Bank and other like-minded institutions have contemplated building some sort of global repository of information detailing the key policies, initiatives and actors in this area as part of a larger landscape to help inform our dialogues with governments around the world on this topic. Well, the Family Online Safety Institute (FOSI) has come out with just such a tool!

The **FOSI Global Resource and Information Directory (GRID)** is "designed to create a single, factual and up-to-date source for governments, industry, lawyers, academics, educationalists and all those dedicated to making the Internet a safer and better place". I have spent a few hours reading through the FOSI-GRID web site, and am impressed at the scale of what they have accomplished in this area. *What a great resource!*

An on-line safety profile for most countries is available, divided into sections detailing basic country profile data; an overview of online safety in the country; pointers to related research; the education system (this is actually a short profile of ICT use in education -- very useful!); legislation; organizations active in this area in the country; and a list of sources of information.

While the scope of what the FOSI-GRID aims to do is necessarily comprehensive, FOSI acknowledges that the resource is not (yet) complete, especially when it comes to documenting what is happening in developing countries. Despite many large-scale initiatives to (for example) equip schools in developing countries with computers going back a decade (or more), it is clear from the FOSI-GRID website that we are still in the very 'early days' of work in scores of countries around the world when it comes to issues related to child digital safety. Reading through the country profiles, one is left with the impression that, in many countries, the approach to date has been to treat this topic largely as a law enforcement issue (related to things like pornography and child trafficking). In other cases, where laws or practices exist, they often seem designed to filter various types of online information.

Some regions of the world appear to be further along in this area; compared with Asia and Africa, for example, the developing countries of Latin America appear collectively to be more advanced in their consideration and treatment of this topic. Here are four excepts that look at countries which I consider to be more 'advanced' in the region in their consideration of ICT use in education:

*Indonesia:*

*Overall, there is little information available, with the exception of the Internet Sehat site, which deals with anything other than the risks to children associated with online pornography.*
Thailand:
Internet safety does not appear to be taught as part of the ICT curriculum, although some basic information is available to students and teachers on the SEMA portal, an educational intranet providing learning materials for children.

Sri Lanka:
No information could be found on government-run online safety initiatives in Sri Lanka and the topic does not currently appear to be part of the curriculum in schools. The website for the country’s Computer Emergency Response Team (SLCERT) does contain an article with advice for parents in its Knowledge Base but other than that, advice is of a practical nature relating largely to security vulnerabilities and how to keep equipment free from viruses.

Vietnam:
There is currently no information available regarding Internet safety lessons in schools.

Now, it is certainly possible that language issues may be complicating international efforts to document what is happening in these countries. (FOSI states that about 25% of the information in this resource is being made available in English for the first time.) That said, the impression that I get when reading through the FOSI GRID profiles resonates with my own experience when speaking with many ministry of education officials on this topic in the region. And when speaking with academic researchers as well --> In many instances, the 'research' section of individual country profiles only contains the following note: Information currently unavailable. If you have content which you feel should be added to this section, please click the e-mail icon at the top of the page to notify our Editorial Team.

So: While the FOSI-GRID is undoubtedly useful to policymakers interested in learning more about how different countries treat child digital safety issues, it also lays bare the great gaps in our collective knowledge base in this area as well.

Judging by this video on YouTube, there are more useful information and tools to come in future iterations of the FOSI-GRID, including a comparative 'benchmarking' of country progress along various themse. This will also be a great resource, which will doubt occasion much discussion and debate.

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'Keeping kids safe online' is not just about insulating children from threats and vigorously prosecuting those who seek to do them harm. Many people, for
example, feel that schools are particularly well placed to help teach children to better identify and evaluate the various types of risks they may face when going online, and how to deal with them. This is especially true in many developing countries, where computers are not available in homes, but are increasingly to be found in schools, connected to the Internet. At the same time, the proliferation of mobile phones and Internet cafes mean that young people are increasingly operating in two separate digital worlds -- that of the controlled environment of (for example) a higher regimented school computer lab, where 'digital literacy' often means instruction in basic word processing applications, and the 'anything goes' context of private Internet kiosks and personal mobile phones, where the knowledge, skills and attitudes necessary to navigate through one's 'digital life' are much more difficult to acquire. Do education systems have a role to play here? Groups active on topics related to child digital safety increasingly are saying: Yes they do.

For our part at the World Bank, we are considering helping to organizing a meeting in Asia region on this topic in 2011 with a few partner organizations to share emerging experiences between government policymakers and key research and advocacy groups working on this topic. Any governments, established NGOs or other national stakeholder groups in the region active in this area are welcome to contact us using the comments section below, or the contact form for this blog.

As a spokesman from FOSI notes in a recent article in the Guardian about the FOSI-GRID,

"Our thinking is that charities can, in this way, act as a convener to create a middle ground where industry, government, law enforcement and researchers can, without agenda, contribute to a factual environment."

Well said. We look forward to using our convening power here at the World Bank to help to contribute, in our own modest way, to the important work being down by other groups active in this area.

Note: The FOSI-GRID site is password-protected. You have register to use the site, but registration is free.

(Hopefully this will not inhibit access to this great resource too much. With the content hidden behind a registration scheme, it doesn't appear that the content is being crawled by any of the major search engines. This means, for example, that a search for 'online safety [insert country name]' does not list the associated country profile page on the FOSI GRID site. This is a shame, as for most of the countries for which I searched, there was little relevant information available, and one presumes the FOSI GRID information would be at the top of the search results.)
Also, in my experience, many users in ministries of education may be reluctant to register on the site, for a variety of reasons, and this information will thus remain essentially inaccessible to them.

For more information on related topics:

- Family Online Safety Institute
- Berkman/UNICEF: Child online safety in the developing world (includes many links to additional resources).
- The ITU and UNESCO are also doing work in this area.

Note: The image used at the top of this blog post ("you can only shield them so much -- you also need to help them to assess risks themselves when they are beyond your protective canopy") comes via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
In many places around the world, the costs associated with investments in educational technologies are perceived to be prohibitive (and often higher than one may initially calculate). That said, there are few places where such investments are not under active consideration.

On this blog, I have criticized "the often singleminded focus, even obsession, on the retail price of ICT devices alone, which is in many ways a distraction from more fundamental discussions of the uses of educational technologies to meet a wide variety of educational goals in ways that are relevant, appropriate and cost-effective."

I have also wondered,

"What are the costs of not investing in ICT use in education? Can we afford them?"

Reasonable people can and will disagree about what the associated costs are for ICT/education initiatives -- as well as how to calculate them, and what these costs might/should be, relative to other potential uses of scarce funds (teacher and administrative salaries, books, school infrastructure, health and feeding programs for students, etc.)

Reasonable people can also disagree on what the impact to date of such investments has been -- a frequent topic here on this blog.

But let's leave aside such discussions and debate for now.

As part of engagements in various countries, I sometimes propose the following 'thought experiment' to provoke policymakers to take a step back (or two -- or five!) and think more broadly about why they are looking to introduce ICTs in their schools. As part of this process, I present the following scenario:

Let's assume that, by 2025, *all* hardware and software costs related to the use of information and communication technologies to support learning were zero.
How might this change the way you consider the use of ICTs to support the goals of your education system?

*If we removed considerations of cost from the equation, how might we conceive of the use of technologies in education? Would our approach then be consistent with our approach today?*

Now let's be clear:

- It is a truth pretty much universally acknowledged that hardware costs will continue to fall. In addition, the rise of free and open source software, the new low-cost app economy and the open education resources (OER) movement has meant that, in many cases the applications (and the content that is sometimes bundled with them) are in many cases falling in price as well.

That said,

- Hardware and software costs aren't going to be near zero any time soon.
- Even as prices continue to fall -- and, for the sake of the sake of our scenario here, even as they approach zero -- poor communities (and poor countries) will still have much greater difficulty meeting such costs.

And of course:

- Hardware and software costs aren't the only costs incurred in these sorts of investments (and may not even be the largest component costs). That said, such costs are pretty easy to understand and calculate, and are in my experience the two costs that many policymakers (rightly or wrongly) consider most important.

With those caveats in place,

*Can we learn anything from a thought experiment of this sort?*

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So much of the current planning around the use of educational technologies is concerned with what is happening and what is possible *today*, and the perceived future needs of industry and society related to the use of such current technologies (e.g. "we need to teach kids how to use computers").
I once had a 15 minute conversation with an education minister about 'appropriate' processor speeds (back when many users still talked about such things regularly) for school computers. I was impressed by his knowledge of the subject ... while lamenting that 15 minutes of valuable time in our 30-minute meeting was spent discussing this sort of minutiae.

Innovations in the technology sector will almost surely mean that many ICT tools we use now, or are considering using, will become more powerful (and potentially more interconnected), and that there will be new sets of tools available to use five and ten years down the road in the education sector that we haven't even conceived of today. In some cases these may only subtly change the ways things are done, in other cases the potential for change may be more radical.

Given the high likelihood of continued (potentially quite disruptive) innovation in this area, both on the technology and the cost side, sometimes it might be useful to be clear about first principles.

When I speak with many policymakers about their vision for education in 2025 as it relates to the use of technology, what I often hear is a description of new sets of gadgets and cool electronic things in schools. Every child with her own computing device, classrooms walls transforming into interactive touch displays, eyeglasses transformed into personal data projection devices, videoconferences with holograms and on-demand printing of objects in 3D: These sorts of visions are important to contemplate, especially where they may help challenge our conceptions (and preconceptions) of what it possible -- or even likely. But in the end they resemble more of a wish-list of items that can be purchased to rebuild and reimagine the architecture of a school or classroom than a vision for what students should be learning, and how, and how others can support them in this process.

If costs weren't an issue, what would you be seeking to do with technology to support learning?

Would this change your perspective on the role of ICTs from what it is now?

Answers to these sorts questions -- or even the process of trying to answer them -- might help provide some clarity and direction for our more immediate and 'pressing' policy challenges related to the appropriate and cost-effective use of a variety of information and communication technologies in the education sector.

Note: The public domain image used at the top of this blog post ("thinking big thoughts") comes via Wikimedia Commons.
9. What role should 'education' play in donor ICT strategies?

By Robert Hawkins and Michael Trucano
Originally published on Monday, 7 March 2011

A previous post on the EduTech blog asked, *Is there a role for ICTs in international donor aid strategies for the education sector?* Today we would like to turn that question around a little bit, and ask:

"What role should 'education' play in donor ICT strategies?"

The World Bank is preparing to release the final version of its *new Education Sector Strategy*, and has begun the consultation process to inform the development of its *new ICT strategy*. As part of this consultation process, we recently convened representatives from partner institutions and various stakeholder groups to review and discuss the potential treatment of 'education' topics in the World Bank’s new ICT strategy, *Innovate. Connect. Transform*. We thought we would share some of the emerging consensus from the first stages of the on-going consultation and related discussion here, in doing so might be of any interest to a wider audience, and to solicit additional feedback. While the discussions were quite lively, and touched on many different topics and approaches, three main suggestions emerged from the first consultation group around which there was broad agreement. We have tried to succinctly summarize them here:

"*Place the teacher at the center of the strategy*"

Quality teachers, we were told, are the most effective change agents in the classroom. The review group recommended that the World Bank should place "the empowerment of teachers through the use of ICT" at the center of the strategy. As one participant noted, teacher professionalism “can serve as a powerful lever to move the entire system”. As an integral part of this focus on the teacher, the World Bank can, for instance, "more actively support client countries to review teacher competency frameworks and develop strategies to certify and reward teaching excellence". As ICTs continue to transform teaching and learning, "continuous
professional development will be essential" as teachers need to be better equipped to evaluate effective learner-centered approaches and promote the acquisition of various "21st century skills". The group noted that a 'bottom-up' approach empowering teachers at the grassroots level will need both to feed into -- and be supported by -- higher level reform through a focus on policy and planning.

"Policy and planning issues should be approached holistically, and systemically"
The review group agreed that a holistic view of the use of ICT needs to be emphasized at the policymaking level, and that systemic change through the use of ICTs should be highlighted. (This means, for example, that an ICT policy should "not just focus on education management information systems" -- although that is certainly an important component.) The World Bank's convening role was emphasized here as a means in which to bring together policy makers and share global experience. As the field moves so quickly, the group also emphasized the value of so-called South-South learning. Also, "scalability and sustainability of ICT investments should be central to the World Bank strategy to move from the many small scale projects to scaled up, national initiatives". As an important consideration, 'softer' issues such as the importance of change management were emphasized by the review group as key inputs to identifying innovative applications of ICT and taking these ideas to scale. One reviewer emphasized that “the World Bank’s role should be to bridge the gap between the rapidly changing technology sector (as well as global economy) and the skills of personnel in Ministries of Education to ensure the next wave of investments in ICT is well-founded, up to date, and adaptive” (similar discussions around the appropriate institutional structures, skills and partnership necessary to effectively deploy and use ICTs in education have been highlighted previously on this blog). The review group agreed that issues such as the role of private-public partnerships and a better overall understanding of how to work with the private sector are important considerations for policymakers -- and for the World Bank as well. Finally, the review team emphasized that the strategy should ultimately support policymakers to think through the practical 'how to' aspects of introducing new technologies into an education system.

"Monitoring and Evaluation should be a central component of a new strategy"
The third major theme that emerged from the discussions was the importance of monitoring and evaluation. As one reviewer pointed out, “Where is the evidence that ICT investments improve education?" The review group suggested that data and knowledge should be central to the new ICT strategy. The ability to
continuously scan global practices, evaluate the impact of interventions, provide tools for forecasting future trends and explore financial considerations through cost modeling "would be important contributions to the global knowledgebase". While the need for more rigorous data on the costs of investing in ICTs was noted as a key input into the policy making process, the group also turned the cost question on its head by wondering (similar to a recent post on this blog), “What is the cost of NOT investing in this area?”

**Other Considerations:** Other key areas that were brought to the discussion during the review included (to cite just a few examples -- the list here is not comprehensive): an expanded definition of “education” in the ICT strategy to better engage both formal and non-formal actors in World Bank client countries; issues of e-waste and local maintenance, which were highlighted as considerations that should not be overlooked, as strategies to deal with both the upkeep and disposal of hardware investments needs to be considered; and special circumstances related to students with a variety of special educational needs and the use of minority languages were also highlighted. Finally, it was felt that a clear synergy with the key elements of the overall ICT strategy – connect, innovate and transform – would be important in the next iteration of the strategy document.

We would like to thank the international review team for their frank input and welcome any other comments on the ICT strategy, and in particular the education-related component of this strategy, either in the comments section below, or via the dedicated web site for the World Bank Group’s ICT Strategy Consultations, which includes the full text of the World Bank ICT Strategy Approach Paper.

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*Related note:* A ‘frequently asked questions’ annex to the World Bank Education Sector Strategy 2020 (ESS2020) is currently being produced. Here is what it currently says about ICT use:

**7. What does ESS2020 imply for investments in ICT in education?**

*Given the much wider use of ICT in the workplace, a person's facility for using the technology is fast becoming a basic competency. ICT use in education has a clear promise for accelerating learning, especially if countries draw on the global lessons highlighted in the ESS2020 background note on ICT and education. At present, because ICT initiatives in developing countries have been focused much more on supplying schools with computers and internet connectivity than on integrating the technology into curricula at all education levels, ICT has so far largely failed to realize its promise as a 21st-century pedagogical tool. Moreover, the potential uses of ICT in education*
are not limited to the classroom. ICT can also allow much better and timely monitoring of the various dimensions of the education system and is therefore a valuable tool for implementing a system approach to education reform. For example, ICT can lower the cost of implementing student learning assessments and can better link those assessment results to teacher development and to the allocation of education resources. ICT can also make it much easier to supply up-to-date information on teacher professional development programs to prospective trainees and to enable learning opportunities outside of formal school settings.

Note: The image used at the top of this blog post of a fork in the road near the village of Farnham (Dorset, Great Britain) ("which way should we go?") comes courtesy of Toby Cullen via the UK's Geograph project site. It is used according to the terms of its Creative Commons Attribution-Share Alike 2.0 Generic license.
10. E-Reading in Africa

by Michael Trucano
Originally published on Friday, 11 March 2011

Back in 2008, a World Bank study on Textbooks and School Library Provision in Secondary Education in Sub-Saharan Africa [pdf] noted that "There is little or no evidence in any of the 19 countries reviewed of any systematic approach to, or consideration of, the full range of secondary textbook cost reduction strategies", adding that "Only 1 out of 19 countries studied (Botswana) had adequate textbook provision at close to a 1:1 ratio for all subjects and all grades."

In other words: There aren't enough textbooks for most students in Africa, and what is available is too expensive.

A number of groups are looking at this reality and wondering if the use of inexpensive e-book readers may be able to help. One such group at the World Bank is exploring an e-book pilot initiative in Nigeria (which has been examined previously on the EduTech blog). This pilot is looking at what it might take to deliver textbooks in digital formats for reading by secondary school students on dedicated e-readers, and what might happen as a result. It is not just looking at the use of official textbooks, however. The project team is also seeking to investigate the potential impact on educational achievement of making small libraries of digital books available to students on e-readers. In doing so, it is intrigued by studies such as *Family scholarly culture and educational success: Books and schooling in 27 nations*, which found that

"Children growing up in homes with many books get 3 years more schooling than children from bookless homes, independent of their parents’ education, occupation, and class. This is as great an advantage as having university educated rather than unschooled parents, and twice the advantage of having a professional rather than an unskilled father. It holds equally in rich nations and in poor; in the past and in the present; under Communism, capitalism, and Apartheid; and most strongly in China. Data are from representative national samples in 27 nations, with over
70,000 cases, analyzed using multi-level linear and probit models with multiple imputation of missing data."

(If you are interested in this study's findings but don't want to read the full academic paper, you might be interested in the related press release on the University of Nevada, Reno web site, Books in the home as important as parents’ education level.)

This twenty year comparative study of course looked at 'old-fashioned' books -- i.e. the kind made of paper and which often are grouped together on shelves. As the world moves slowly but steadily toward increasing consumption of materials in digital formats, would we expect such findings to still hold? Might there be a difference in the potential impact of the type of 'scholarly culture' identified in this thought-provoking paper when we talk about e-books? These will no doubt be interesting questions to explore going forward.

(For what it's worth: I do wonder about the potential signalling effect of having lots of books visible on shelves in the home, and of children seeing their parents read books regularly -- and how this might change with the widespread use and availability of e-books. In reading cultures where the consumption of digital materials is predominant and where the 'shelves' are virtual, some of the most obvious superficial markers of a 'scholarly culture' within the home -- shelves full of books -- are absent. If these shelves disappear, and if it is difficult for children to tell whether their parents are reading a book, or an email, or the cricket scores, or playing a game, on their electronic media consumption device, would the same effects still be observable?)

The small World Bank e-book pilot (which will potentially be replicated in countries from Tanzania to the Philippines) is far from the only project exploring the potential for e-reading in Africa. The Yoza (m4lit) initiative in South Africa, for example, is making an important contribution to our understanding of the potential for 'reading cultures' to be supported and enabled through the use of digital texts on mobile phones. Another group exploring the potential for more 'traditional' e-readers (if one can even make such a statement about such a new class of devices) in Africa is the Worldreader NGO, which was founded by a former executive who helped oversee Amazon's very successful foray into e-books (the results of which today are most associated with its Kindle e-reading software and device). Worldreader was the recent focus at one of USAID's excellent learning events exploring issues related to the use of mobile devices in education sponsored by the development agency's 'Mobiles for Education for Development' (m4Ed4Dev) initiative (in which the World Bank also participates).
The working hypotheses behind the work of Worldreader are that:

- E-readers will increase access to books due to lower distribution costs and immediate visibility of millions of books available online.
- This will result in a larger number and greater variety of books read, and increased excitement and exchange of ideas around these books.
- The result will be a higher value placed on reading within the classroom, family, and community.
- The results will be specific and measurable, and will, in the long term, increase literacy and opportunity for those involved.

As a way to begin to test such hypotheses, the group is engaging in some small scale pilots, including a year-long pilot study in Ghana (a popular place for pilot projects). A recent progress report from the iRead trial [pdf] available on the Worldreader web site -- and a companion report [pdf] detailing the intervention in the OrphanAid Africa School in Ayenyah -- make for very interesting reading. A final report is expected in October 2011; you may wish to monitor the well-maintained Worldreader blog to track progress.

It is perhaps worth noting that e-books are attractive to many ministries of education in developing countries -- and schools and teachers and parents -- in ways that laptops, for example, are not. Laptops are attractive too, of course (!),
but in many quarters, it is thought that e-books are a better fit with the current technical infrastructure (that, for example, ensures that people are able to charge their mobile phones) and are less 'distracting' than computers and phones (which, after all, allow students to play games, text each other, and offer access to the myriad 'distractions' of the Internet). My point here isn't to start a debate about the potential merits of various devices or educational philosophies, but rather simply to observe that, for certain groups of education policymakers (and not a few of their counterparts in international development agencies), the use of e-book readers often fits rather comfortably within their existing view of educational delivery ("in the end it's just a book, and we understand books", an African education official remarked once to me) in ways that potentially 'disruptive' and 'connected' technologies like laptops and phones do not.

Many people (rightly) cite the falling costs of e-book readers as a reason to be optimistic about the potential for the widespread adoption of e-readers over time in developing countries in Africa and Asia. This is certainly a trend that is very exciting. That said, I have been involved in more than a few presentations where the projected costs for physical textbooks and the costs for e-readers are graphed over time. With the costs for e-readers projected to continue to fall, at some stage a point of intersection is achieved. It is at this juncture, advocates say, that the costs for using e-readers will help ministries of education achieve significant cost savings. This is potentially true ... assuming a whole set of other things are in place that ensure that locally relevant content is available at affordable prices to put on the (increasingly low cost) devices. While end user device costs are important, they are only one piece of the puzzle.

Even if the news that emerges from the pilots sponsored by the World Bank, Worldreader, USAID and other groups is encouraging, much work will have to be done if the necessary 'ecosystems' are to be in place to ensure that there are (to cite just a few examples) relevant, inexpensive digital texts in local languages and efficient distribution networks for related hardware and digital content -- to say nothing of vibrant markets in which firms, civil society organizations, education institutions and social entrepreneurs can participate to ensure that local needs and demands for reading materials are met. As with any potentially disruptive innovation, there are also entrenched interests that may, um, 'complicate' things. Traditional publishers, for example -- including, in some places, affiliated arms of ministries of education themselves -- are not disinterested actors here.

Questions about whether -- and how -- e-books can help bridge achievement gaps are certainly not limited to Ghana, Nigeria or South Africa. But it may be from such places that some of the most interesting answers emerge.
Also of potential interest:

- For another take on Worldreader, see this article in the Stanford Social Innovation Review

- Many discussions of the potential for digital textbooks on e-readers draw inspiration from the movement to create 'open textbooks'. Here's a useful review [pdf] of what's happening in that area.

Note: The public domain image of some young readers and their teacher in Djibouti used at the top of this blog post ("a, b, c, d, ... E?!") comes via Wikimedia Commons. The embedded video of the Worldreader pilot in Ghana comes via YouTube.
In a post today on the Education for Global Development blog, World Bank education sector director Elizabeth King reports back from Jomtein, Thailand on the High Level Group Meeting on Education For All (EFA). This event was a successor, of sorts, to the landmark event convened in Jomtein back in 1990 that kickstarted the global movement for Education For All, which has been a primary goal for many developing countries (supported by most international development agencies) for the past two decades. The title of Beth's blog post sums up her message very nicely ("Jomtien, 20 Years Later: Global Education for All Partners Must Renew Commitment to Learning") and echoes key themes and perspectives expressed in her keynote address [link to pdf] to 50 education ministers back in January at the Education World Forum. I won't try to summarize her calls to action any more here (for that, I recommend you see the text of her blog and, especially, her excellent keynote speech). I would, however, like to use the opportunity to revisit the question of the relevance of ICTs to this global agenda.

Back in 2000, as part of the official Notes on the Dakar Framework for Action [pdf], explicit attention was paid to how to 'Harness new information and communication technologies to help achieve EFA goals' (Part IV Strategies - #10, items 69-72):

\[69: Information and communication technologies (ICT) must be harnessed to support EFA goals at an affordable cost. These technologies have great potential for knowledge dissemination, effective learning and the development of more efficient education services. This potential will not be realized unless the new technologies serve rather than drive the implementation of education strategies. To be effective, especially in developing countries, ICTs should be combined with more traditional technologies such as books and radios, and be more extensively applied to the training of teachers.\]
¶70: The swiftness of ICT developments, their increasing spread and availability, the nature of their content and their declining prices are having major implications for learning. They may tend to increase disparities, weaken social bonds and threaten cultural cohesion. Governments will therefore need to establish clearer policies in regard to science and technology, and undertake critical assessments of ICT experiences and options. These should include their resource implications in relation to the provision of basic education, emphasizing choices that bridge the 'digital divide', increase access and quality, and reduce inequity.

¶71: There is need to tap the potential of ICT to enhance data collection and analysis, and to strengthen management systems, from central ministries through sub-national levels to the school; to improve access to education by remote and disadvantaged communities; to support initial and continuing professional development of teachers; and to provide opportunities to communicate across classrooms and cultures.

¶72: News media should also be engaged to create and strengthen partnerships with education systems, through the promotion of local newspapers, informed coverage of education issues and continuing education programmes via public service broadcasting.

(For excerpts from some of the key documents related to the potential link between ICTs and EFA, you may be interested in the Quick Guide to ICTs and the education Millennium Development Goals (MDGs) that we put together at infoDev a number of years ago.)

These themes are echoed (although sometimes only faintly) in a number of donor strategies in the education sector that have appeared over the past decade (including those of the World Bank). One can (and will) argue about the language contained in such documents, what is left in and out, what appears to be implied, how this rhetoric changes over time, etc., but there doesn’t appear to be a lot of argument about the general messages -- that ICTs can have an important role to play. The question, is, of course: How?

An exploration of potential answers to this question is one of the animating preoccupations of this blog. One interesting approach is that of so-called 'mega-schools', which, proponents argue, "should be seen as catalysts for integrating all elements of schooling into an educational ecosystem fit for the 21st century." What is a 'mega-school'? The term can be seen as an intellectual successor to the term 'mega-universities', which was coined by Sir John Daniel back in the 1990s to refer to distance learning institutions at the post-secondary level which reach at least
100,000 students. Sir John, who has been one of the leading thinkers on and proponents of greater attention to models for open and distance learning in his various influential leadership positions (including serving as assistant director-general of UNESCO and vice-chancellor of the UK Open University before assuming his current role as President and CEO of the Commonwealth of Learning), defines a 'mega-school' as a secondary school that helps educate at least 10,000 students with the help of a variety of distance learning and teaching tools and methodologies. There are important differences between a mega-school and a mega-university, he notes, including the fact that, by reaching out to many marginalized students, mega-schools have to meet myriad challenges related to the fact that many students may drift in and out of schooling due to their particular life circumstances.

Sir John wrote a very useful and provocative book on this topic last year, Mega-Schools, Technology and Teachers: Achieving Education for All. The global movement towards EFA has put initiatives seeking to provide all children with access to a quality education higher on the agenda in many countries than ever before. But what do we do when quality doesn't scale quickly or inexpensively enough to meet the exploding demands for education in many developing countries? In seeking to provide answers to this vexing question, Sir John Daniel challenges some of the conventional wisdom and approaches about what doesn't work in education -- and what does. In many places, conventional classroom-centric models of education don't work very well, especially for poor students in poor countries -- and even where they do, they often can't be successfully scaled up or adapted to the particular needs of teachers and students. For me, this book helps to separate some of the hope from the hype about the real potential benefits of the cost-effective application of information and communication technologies to some of the seemingly intractable challenges facing many of our education systems around the world. Technology can play a key role here, Daniel argues, but only where we are willing to abandon 'business as usual' and consider educational opportunities beyond those offered through conventional formal schooling. That said, as proclaimed in the title of a lecture he gave at East China Normal University in Shanghai last year ("New Technologies in Education: Not there yet!"), while we have come a long way, there is still a long journey ahead.

Note: The image used at the top of this blog post of the ferry Mega Smaralda docked in the Wärtsilä Helsinki Shipyard ("are we still stuck in the harbor?") comes from Lucarelli via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
12. When students are in charge of maintaining the computers in schools

by Michael Trucano
Originally published on Tuesday, 5 April 2011

How do you keep computers in schools in working order? Basic technical maintenance is a perennial challenge for many schools in developing countries. The phenomenon of unused -- and unusable! -- computers in schools is all too well known to anyone who works in the field. While it is a bit of an exaggeration to label this a 'tragedy', few could argue that this isn't a very unfortunate situation -- especially given the high costs associated with acquiring and installing such equipment, to say nothing of the learning opportunities lost when students and teachers are unable to use expensive equipment that is already paid for.

What to do about this? I regularly encounter a number of common answers to this question.

Visiting rural schools in Russia a few weeks ago, for example, I heard headmasters ask repeatedly for government assistance to finance a computer engineer to be assigned full time to their school to ensure that the computing equipment is well maintained. This is one approach to sustaining school computer labs that tends to work pretty well, although it can be rather expensive (often, I find, prohibitively so).

Another approach was explained to me by a headmaster in a rural school in Eritrea, who said he kept the computers locked in his office to ensure that they did not 'break'. (I checked them out and, sure enough, all appeared to be in great shape!)

The longer computers are used systematically in school systems, there appears to be a higher likelihood that challenges related to technical support will result in more training for users and admin staff, as well as the mandated introduction of various complementary practices and procedures (e.g. filtering access to sites that may contain malware, banning use of USB drives, regularly checking to see that anti-
virus software is up-to-date, etc.). Depending on how well these sorts of things are done, these sorts of activities achieve varying degrees of success.

Some schools and school systems have learned over time to standardize their equipment purchases where possible to reduce the complexity of maintaining different types of equipment. This sometimes include a vow to limit or, in some cases, even ban the use of donated computer equipment, in the belief that such equipment is more prone to break and thus require more maintenance or replacement.

(These approaches are not mutually exclusive, of course.)

One approach that is not well known, but which perhaps should be, is to have students assume primary responsibility for the technical maintenance of a school's computer-related infrastructure.

A recent presentation and discussion at the World Bank by AED's Eric Rusten and Josh Woodard explored lessons from schools in Macedonia and Indonesia (Sumatra) that have been doing just this. With support from Cisco and Qualcomm's Wireless reach program, AED recently published a very useful Computer System Sustainability Toolkit, which Eric and Josh described in depth.

Side note: These sorts of arrangements have been around for a long time in some schools in a sort of ad hoc way, and I see examples of this sort of thing in a variety of contexts all around the world. That said, I find that such arrangements are often the result of an enterprising teacher or student in a given school, with the example often not shared with or seized upon by neighboring schools. A few groups have sought to systematize the processes for this and have been successful in replicating some models across a number of schools. In the United States, for example, notable initiatives in this regard include GenYES and the New York City-based MOUSE program (which was profiled in the USA's new National Educational Technology Plan as an example of 'Using Students as Technical Resources'). This was also one component of a World Bank-funded program a decade or so ago that explored the use of school-based telecenters.

Why consider such an arrangement? Typically, the first reason this is considered is to cut costs: 'We won't have to pay students, and computer technicians are expensive.' Indeed -- and especially in many developing countries -- schools often find that they can't afford to retain staff with IT skills, that replacement staff often lack the ability to manage computer systems, and that systematic training programs to help overcome the related challenges are often insufficient. The
result? School computer labs degrade over time, and sometimes become simply unusable.

The immediate cost savings associated with having students perform 'tier one' technical support in schools may not be the only reason to consider something like this, however.

Based on its work in Macedonia and Indonesia, the AED team sees the creation of student support technician clubs (SSTCs) as a useful 'first line of defense', a way to help school computer labs become 'self-sustaining' (through a variety of revenue generation, or at least cost recovery, activities) while at the same time helping to instill in students a greater sense of confidence in their own abilities. In many developing countries, computers are very expensive investments for schools -- especially in rural areas -- and, by trusting students with their upkeep, schools are sending a message of sorts to students that they can be trusted with such important responsibilities. At the same time, students develop sets of skills that are believed to be quite relevant to the world of work.

SSTCs were introduced in 12 schools in Macedonia as part of the USAID-supported USAID Primary Education Project, through a very small grant from Microsoft. (See mk connects: Macedonia Links Education and Connectivity for an overview of this project; note that link is to a PDF document). From its small beginning, the program has now spread virally to 340 schools across the country (about 90% of all schools in Macedonia), based largely in the early stages on local demand and informal relationships between schools. Lesson from this experience were then brought to the Indonesian island of Sumatra, where a small six-school pilot project has been underway.

One of the mandates of the SSTCs is that 50% of club member are girls. According to the AED team, in Macedonia this has resulted a few years on in a situation where 90% of elected SSTC officers, and 70% of SSTC members, are girls, challenging the belief of some that computer technical support is only 'for boys'.

Over time, a number of tools and structures have developed in Macedonia to support the work of the SSTCs, including an online FAQ for members, a popular technicians' blog, and official recognition from the Ministry of Education formally acknowledging the skills of SSTC members. The MOE has now assumed responsibility for the SSTC activity, embedding it within its formal institutional structure.
SSTCs can be about more about just keeping school computers running. Some clubs help support teachers in various ways -- this is an especially relevant activity in many places, given that teacher laptop ownership programs and schemes are increasingly popular around the world. They can also be used as a way to promote entrepreneurship preparation programs, with fee-based SSTC services marketed to local communities.

Based on its experience in rural Sumatra, AED sees SSTCs as a potentially useful tool to help change the dynamic between schools and the communities in which they operate. Whether or not this is the case, the Computer System Sustainability Toolkit -- designed to support the development of SSTCs -- full of useful sample and blank worksheets, templates, planning calendars, discussion guides, usage surveys, announcements, etc. that school-based clubs can learn from and adapt in support of their own particular goals.

A particularly interesting anecdote shared in the discussion at the event was the role of SSTC members as 'truth testers' of sorts when vendors need to be called in to deal with more complicated technical issues. This can help prevent a situation where vendors attempt to 'upsell' schools on services that they may not need (much like an auto mechanic may try to convince an unknowing car owner that he needs a whole bunch of expensive 'extras'). At the same time, by watching closely and learning from what the vendor does, perhaps the next time something happens SSTC members will be able to handle the problem themselves.

One very useful practice that has been explored successfully in the Sumatra pilot is the creation and use story-based instructional videos by SSTCs for SSTCs. One video example shown documented the selection process for members of a school's club, which was shared via DVD as a way to demonstrate to other schools how they might want to consider doing something similar. (We'll post links to some of these videos once we have them, in the comments section below and, at a later date, in a separate blog post on examples of the use of cheap videocameras in education.)

The introduction of things like student support technicians clubs is a not a silver bullet solution to the challenge of school computer maintenance. That said, based on the emerging experiences in Macedonia, Indonesia and elsewhere, it is an option that many countries would do well to consider.

*Note:* The image of SSTC member at a school in rural Indonesia ("how may I be of service?") used at the topc of this blog post comes from the Computer System Sustainability Toolkit. It is (c) 2010 by AED, used with permission of AED.
I was honored to be asked to deliver one of the keynote addresses at this year's eLearning Africa event at the end of May. (If you'll be in Dar for the event, I look forward to seeing you there!) The organizers asked me to submit an abstract for my presentation by last week. In the belief that sunshine is the best disinfectant, and in the spirit of what I take to be the increasing appetite of the World Bank to be more 'open' about what information it makes available publicly, I thought I would (mix metaphors and) send up a trial balloon of sorts here on this blog, sharing one of the themes I am hoping to explore in my short talk, in the hope that doing so will make my presentation stronger and more relevant to the audience. If past experience is any guide, there will be no shortage of people who comment (below, on their own blogs, via email and Twitter) about where and how I've got things wrong.

Before I get to that, though, some background:

I first was involved with ICT use in education in Africa about a dozen years ago when I was working with the World Links project in Ghana to help introduce teacher professional development programs related to first use of computers and the Internet in a number of pilot schools in Accra, Cape Coast and Kumasi. If you'd told us back then that, only a decade later, over 1500 people would descend on Accra to participate in the third 'eLearning Africa' conference, we'd have thought you were crazy (and mind you, we were often criticized for being 'true believers' back then, viewed rather suspiciously and even negatively by many others in the development community as 'techo-evangelists' of sorts)! About five years ago, when I was with infoDev, we attempted to provide a crude 'map' of what was happening in the field across the continent. The resulting Survey of ICT and Education in Africa, published back in 2007 in two volumes, rather immodestly sought to "gather together in a single resource the most relevant and useful information on ICT in education activities in Africa" in the "hope that this publication
[would be] a first step in a larger, on-going, systematic, coordinated initiative to track developments in technology use in the education sector to help inform a wide variety of stakeholders interested in the topic as they seek solutions to larger, more fundamental educational and development challenges in the years ahead."

Four years on, the holes in this work are even more glaringly apparent than they were back then, when we said that

"ICT use in education is at a particularly dynamic stage in Africa, which means that there are new developments and announcements happening on a daily basis somewhere on the continent. Therefore, these reports need to be seen as 'snapshots' that were current at the time they were taken; it is expected that certain facts and figures presented in the Country Reports may become dated very quickly."

eLearning Africa is, in some ways, an annual 'snapshot' -- face-to-face and up-to-date -- of many of the things that the infoDev Survey tried to highlight. (For other ways of staying up to date on progress in this area, you may be interested in an earlier blog post on Tracking ICT use in education across Africa).

With that said, ...

In Dar this May, I will present a version of a talk I often give on 'Innovations in ICT use in education around the world'. The short abstract I provided to the eLA organizers looks like this:

**Innovative uses of ICTs in education from around the world:** Many of the uses of educational technology regularly described as 'innovative' have actually been around for quite some time. This rapid-fire presentation will highlight some of the 'new' innovative uses of ICTs in a variety of contexts from around the world, with a special attention to those of potential relevance to educators in Africa. In doing so, it will propose some promising approaches and issues for policymakers in Africa to consider along five general themes: content; community; personal; mobile; and measuring."

I'll provide a quick tour through many of the initiatives that have been featured on this blog over the past two years. (One thing I'll strike from my presentation is a discussion of the pioneering work of Sugata Mitra, as he will be speaking about it himself at the event!) Among many examples, I'll highlight the EVOKE project, along the way referring to a fascinating new study just published by the World Bank's infoDev program that asks, "Making Money from the Virtual Economy: Science Fiction or Development Opportunity?"
Converting the Virtual Economy into Development Potential: Knowledge Map of the Virtual Economy [infoDev, 2011]
The Bank's infoDev program released a fascinating study last week by Vili Lehdonvirta and Mirko Ernkvist, which is being featured in lots of places, like *The Economist*, the *BBC*, and *The Washington Post* ... plus, in what is probably a first for a World Bank study, in places like *Ars Technica* and *Kotaku*! (Perhaps some day we'll even get /.ed/). If you are interested in a quick overview of some of the 'non-traditional' ways that ICTs are offering work opportunities to people in developing countries, this paper is a good introduction. This study pegs the market for gaming-for-hire services -- where, for example, you hire someone in China to play a videogame on your behalf, advancing you through the early levels so that you can concentrate your time on the more challenging stuff later on -- at $3 billion in 2009. Significantly, the authors state that most of this money went directly to developing countries, 'as opposed to being eaten up by Western intermediaries'. The report contrasts this figure with the market for coffee, which was $70 billion globally in 2009, but only $5.5 billion of which went to countries that produce the coffee beans. Gaming-for-hire services are not the only example of this kind of thing -- it notes that you can, for example, hire people to click en masse on the 'like' button on your Facebook page, or to record lots of hits to your web site. Other types of such 'microtasks' are possible -- people just have to be 'connected' in some way. Like, for example, having Internet access -- or sometimes even only a mobile phone. Fascinating stuff!

I expect that enterprising policy makers development professionals will seize on this infoDev publication to explore the potential for 'virtual microwork' of various sorts in Africa, especially given the increasingly ubiquitous availability of mobile phones and the great advances in connectivity that are occurring because of the various submarine fiber cables that are landing (or soon to land) on the shores of the continent. There is indeed great promise and potential here that merits serious exploration. (If you are interested in a pioneering example of this sort of thing that is already happening, have a look at the fascinating talk that Nathan Eagle gave at ETech 2009 on *Crowd-Sourcing on Mobile Phones in the Developing World*.)

As with anything that is new, I expect there will be an opposite reaction as well from some quarters, who will see a danger that this sort of thing offers yet another opportunity for 'rich companies in the North to off-load low-paid drudgework to workers in virtual sweat shops of sorts in the global South'. Related discussions of the promise and peril of outsourcing microwork to developing countries are well worth having, and the infoDev study will no doubt be required reading to inform such discussions (pro and con). While leaving such discussions for people smarter
than I am to have in other venues, I do note that, in the explosion of ICT hardware and software I see appearing in schools across Africa, I see very little of it designed or assembled on the continent itself, which leads me to ask:

*As African communities become increasingly digital, to what extent will they be home to **makers**, and to what extent will they be populated by **takers**?*

In other words:

*To what extent will people in Africa rely on ICT tools created by others ('take'), and to what extent will they create (and evolve and innovate) ICT tools themselves ('make')?*

Many people who work in international development will be familiar with factoids and observations that say something to the effect of "in the early 1960s, per capita GDP in Ghana was about the same as South Korea's -- and look what's happened since".

*For what it's worth: The actual citation often refers to GDP per capita at the time of Ghana's independence in 1957, although you can make the same comparison between South Korea and a number of other countries around the same time too. If you have a look at the excellent online Gapminder tool, for example, you'll quickly see that income per person (GDP/capita, PPP$ inflation adjusted) in South Korea in 1960 was actually lower than in North Korea(!), Somalia, Chad and the Solomon Islands, just to pick a few countries at random. (Those who know their history will also note that the figure for South Korea may be anomalously low, given that it was just emerging from war, but of course the beauty of making statistical comparisons is that one is often able to cherry-pick to prove a point.)*

In 1960, there can be little doubt that both South Korea and Ghana fell into the 'taker' camp. Given the dynamism of Korean firms like Samsung and LG in the global marketplace, and the innovative developments in the Korean videogaming industry, few would argue today that Korea hasn't transitioned fully into the 'maker' category. Indeed, for many, Korea is the epitome of this type of transformation!

*Lessons from the Korean experience have been detailed in a number of influential publications, including the World Bank-OECD study (2000) Korea and the Knowledge-based Economy: Making the Transition (unfortunately I can't provide a direct link to this publication, which is behind a World Bank paywall, but I can provide links to a follow-up World Bank Institute publication in 2006 and a number of related knowledge activities). A desire to explore the relevance of the Korean experience to other countries lies at the*
heart of the close cooperation between the World Bank and Korea on ICT/education topics as well.

In addition to eLA, there is another continental gathering that those in the ICT and education fields would do well to pay attention to (and support!): Maker Faire Africa. For those unfamiliar with the concept:

First held in the Silicon Valley are in 2006, a Maker Faire is an event created by MAKE Magazine to "celebrate arts, crafts, engineering, science projects and the Do-It-Yourself (DIY) mindset." Transplanted to Ghana in 2009, fueled in part by the momentum and enthusiasm that surrounded the TED Global event in Arusha, Tanzania, Maker Faire Africa bills itself as a 'celebration of African ingenuity, innovation and invention'.

One of the under-reported developments of the past few years (at least in much of the global press, in my opinion, which tends only to consider Africa when considering things like war, famine and corruption -- although last year you could add football/soccer to the list!) has been the emergence in various spots across Africa of clusters of innovative small IT-related firms and groups. In Kenya, for example (the site of eLearning Africa 2007) one can quickly point to initiatives like Ushahidi and iHub to find examples of the dynamism of IT entrepreneurs of various sorts who are real 'makers', not just 'takers' of innovative products and services from other parts of the world. While not strictly IT-focused, blogs like Afrigadget, the Timbuktu Chronicles and Nubian Cheetah showcase countless examples of, for lack of a better term, really cool stuff that entrepreneurs, tinkerers and inventors across the continent are doing, putting an African face on traits and activities that too many people in the rest of the world (and, regrettably, perhaps even in some policy circles in Africa) wrongly consider to be the domain of folks in 'advanced economies'.

One worry expressed by some groups involved in ICT use in education in Africa is that many of the ICT literacy curricula that accompany the roll outs of computers in African schools are largely about 'taking'. How to operate in a Windows computing environment, how to use basic office applications like word processors, spreadsheets and presentation software ... one criticism that I often hear of such activities is that they are geared to help develop low level clerical skills, and not to provoke the curiosity and help develop the skills of the types of people who are celebrated by outlets like Afrigadget. This is not to say that the development of very basic computer literacy skills is not important -- of course it is. That said, perhaps we should also be asking,

How can ICT use inside and outside schools can also help to support the development of a generation of 'makers' who can help ensure that African
schools not only graduate future workers and consumers who will represent a source of profits for IT firms in the rest of the world (Africa's importance in this regard will only continue to grow) but, more importantly, do their part to educate future generations of innovators and entrepreneurs who will export their products, services and ideas across the continent, and across the world?

Some people may look at today's development data figures and scoff that this blog post is yet another example of the type of thinking characteristic of a starry-eyed 'Western aid worker'. Such folks are certainly entitled to their opinion. At eLearning Africa this year I hope to run into and learn from many folks who think differently.

Note: The image at the top of this blog post ("moving forward with innovation and ingenuity") comes courtesy of Maker Faire Africa via the Maker Faire Africa photostream on Flickr. It is used according to the terms of its Creative Commons Attribution 2.0 Generic (CC BY 2.0) license.
Two to three years ago, I found very little traction when trying to initiate discussions around the potential use of mobile phones in education with many counterparts in education ministries around the world. (And when this *was* discussed, talk usually centered on how to ban them from schools.)

This is now changing very quickly! Many factors appear to be behind this change -- including, it is probably worth noting, the strong apparent interest by many companies to get in on the ground floor of what they feel will be very large markets related to 'm-learning' in developing countries in the coming years. (I now get so many cold calls from vendors every week wanting to share information about their 'm-learning solutions' that I let all phone calls ring into voicemail by default.)

With momentum building around 1-to-1 computing initiatives (where every student receives her own laptop) in many countries, many governments are embarking on large-scale roll outs of educational technologies as never before. However one feels about the potential relevance of mobile phones in education (and reasonable people can certainly disagree about this), it appears to me to be a topic that at a minimum merits some discussion in many education systems, given that small, connected computing devices known today as mobile phones are increasingly to be found in the pockets and pocketbook of teachers, and even students, at rates perhaps unimagined only a decade ago. It is worth noting that this large scale roll-out of computing devices in the hands of teachers and students has largely happened without any government subsidy at all. Given this fact, is it worthwhile for governments to consider taking some of the monies dedicated for the purchase of ICT hardware and use it instead for other purposes (more/better education content? more training? better connectivity? something not at all ICT-related?)? Even if you feel that mobile phones are not relevant to discussions of technology
use in education, perhaps it is worth considering these sorts of questions before dismissing such use out of hand.

My point here is not to revisit the related arguments often advanced and debated about the potential use of mobile phones in education (for that, you may wish to have a look at the numerous EduTech blog posts on the topic). Instead, it's to take a quick look at an interesting set of inter-related pilot projects that hasn't received much attention internationally.

In Pakistan, some innovative folks are exploring how basic text messaging (SMS) can be used in the education sector to the benefit of people with even very low end mobile phones, leveraging the increasing high teledensities found in communities across the country.

What's happening in Pakistan in this regard? A lot, it turns out, although admittedly only in pockets and at a rather modest scale to date. The country is perhaps not unique in what is being explored (most everything being tried there is being tried in various other places as well), but that doesn't mean it isn't quite interesting. For example:

In February, almost 150 third year students at Asghar Mall College in Rawalapindi (note: 'third year' in this context would be the rough equivalent of the first year at university in, for example, the United States) for whom authorities had mobile phone numbers on file began participating on a voluntary basis in a daily vocabulary quiz exercise delivered by SMS. These young men -- from middle to lower middle class backgrounds -- are sent a simple multiple choice question. Texts are addressed to each student individually, using the equivalent of a 'mail merge' function that will be familiar to anyone who has had to send out 'blast' emails or faxes). They reply via SMS, and then receive an automated response, based on their answer. In this response, their answer is repeated, a notation is made about whether the answer given was correct or not, and the correct answer is incorporated into a sample sentence.

This sort of thing is no substitute for school, of course. But, given current test messaging rates in Pakistan -- a country with some of the fastest growth in recent years in text messaging in the Asia-Pacific region, as well as some of the lowest tariff rates -- it is quite cheap. It is "on-the-go". It is supplemental to what is being taught in the classroom, and increasingly easy to do, given the technology tools and code base out there. While Pakistan may not see high household penetration rates of desktop computers connected to the Internet for many, many years to come, most every household already has access to a small connected 'computer' of
a different sort -- the mobile phone -- and this project is seeking to capitalize on this reality.

One thing perhaps that is worth mentioning here is that, for some of these students, who have been educated in a system where very large, lecture-based classes are the norm, *this may be the first time they have received 'personalized' feedback of any sort from their instructors.*

The team in Pakistan is asking all sorts of interesting questions as part of their work. How can the potential impact of each message be maximized, especially given that these messages constitute just one small part of a large stream of messages -- cricket scores, notes from friends and family, jokes, news items, scripture passages and horoscope advice -- that students receive every day? What is best learned or reinforced through such interactions? What are the most effective ways to sequence and scaffold such messages over time?

In the process, much user-related information is being collected, helping to answer some basic questions for which there are not yet good, reliable data:

- How many young students have phones?
- How many can afford to participate in education-related activities via mobile phone -- and are willing to do so?
  
  (*Related to this: Are there ways to subsidize SMS traffic for various populations? And what if people actual respond to the SMS quizzes -- can this sort of thing at scale?*)

Vocabulary-building and grammar quizzes are just two potential applications possible as part of this sort of SMS-based interaction; opportunities for quizzes in various academic areas are easily imagined. This could be great for test preparation, for example -- a potentially fertile market for private firms in Pakistan. Indeed, project proponents hope to use this as a way to help to stimulate private sector activity and innovation in this area, especially for young entrepreneurs, given what have turned out to be very low piloting costs.

The software they are using for all of this is home grown; the hope is to eventually open source it so that others interested in doing this sort of thing don't have to start from scratch. (*Similar efforts are underway in other parts of the world -- FrontlineSMS:Learn has been [piloted in neighboring Afghanistan](https://www.frontlinesms.com/learn), to cite just one example.*)

In addition to the potential utility of the messages themselves, the people behind this project see potential value in establishing a 'relationship' between government and its constituents and key stakeholders. Are there possibilities
here for government to learn using SMS, they wonder? If a relationship via test message is established during schooling between students and education authorities, can government remain engaged with students after graduation, continuing to provide targeted informal education services as might be useful?

As my World Bank colleague Zubair Khurshid Bhatti notes, "Engagement with student and parents is critical for improved governance of the tertiary education sector. Governance possibilities are also huge for primary and secondary schools, where very large percentages of parents and school committee members have access to phones. This project starts to put in place some of the architecture to help support interactive targeted communication with the real beneficiaries."

Based on early returns from the pilot, the Provincial Education Department of the Government of the Punjab is showing active interest in exploring these sorts of activities further, and the project principals are already planning to expand the scope of their activities. Why not try sending SMSs to parents, they ask, challenging them to pose a question to their children, based on something that was meant to be on the curriculum for that week? This would, in a very small, modest way, alert parents to what students are supposed to be learning. If students don't know the answer, this may trigger parents to push their kids more, and/or to question whether the school is doing a good job in this area (including whether or not the official curriculum is being followed at all!).

As in many other places, people involved with this project are investigating how information submitted via SMS can be entered directly into central databases, utilizing mobile phones as front line data entry tools. They note that this offers many advantages over the use of desktop computers or laptops, which often require technical support and training not necessary for phones (which people are able to figure out how to use, and keep working, largely on their own). They are also exploring how it might be possible to better monitor the attendance of teachers through things like the use of GPS-tagged photos snapped and transmitted via low end 'feature phones' (an upcoming EduTech blog post will look at a pilot funded by the World Bank attempting to do this sort of thing in another country).

The point here is to demonstrate that, in certain circumstances, education systems may not need to 'wait for all citizens to have smartphones' to start exploring how they might be able to take advantage of the fact that mobile phones are increasingly ubiquitous in many teaching and student populations.

**It is also to put out a call for assistance:** The team in Pakistan has developed a useful technology infrastructure to deliver quizzes via SMS. Are there any groups with sets of, for example, English-language vocabulary quizzes that could easily be utilized in an SMS-based effort of this sort? (For those interested in such things,
you can view some of the SMS quizzes, and related results, online.) The team in Pakistan do not have access to rigorously tested banks of questions and answers that might be profitably deployed to assist in scaffolded vocabulary development. If there are any academics or non-profit groups that have access to such things, or if any readers could point the team in Pakistan to open access resources of this sort, please do leave a comment below or contact me directly.

*Note*: The image used at the top of this blog post ("relevant for education? send 1 for 'yes', 2 for 'no', 3 for 'not sure'") comes from Southview legion via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
**15. Crowdsourcing, collaborative learning or cheating?**

by [Michael Trucano](mailto:mailto@domain.com)

Originally published on Wednesday, 4 May 2011

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**Challenges for educators in the Internet age**

Wherever there are rules, there are almost inevitably people looking to break them, especially where a compelling incentive exists for those willing to risk getting caught. When I was a classroom teacher in Czechoslovakia and the United States, I often found that some of the most 'innovative' practices I witnessed over the course of a school year fell under the heading of what I (and the school) considered 'cheating'.

Before the recent tragic events there, the education establishment in Japan was transfixed earlier this year by a cheating scandal that highlights some of the challenges that the use of new technologies today pose for educators.

As in many other countries, university entrance examinations in Japan are high stakes affairs. In many cases, one's performance on these tests can be a large determinant in the course of a person's adult life, as the university you attend has traditionally played a critical role in a person's subsequent employment opportunities (and sometimes even choice of potential spouses!).

In [this particular case](mailto:mailto@domain.com), a student is alleged to have used a mobile phone to have questions from the exam posted to one of the many web sites that provide online forums for people to get answers to their queries on virtually any topic. Anonymous strangers (presumably not knowing that these were actually from a university entrance exam that was in progress!) then offered their help in answering the posted queries. Fortunately for the authorities -- and unfortunately for the alleged perpetrator -- given that all this was posted on the Internet, the evidence could not be so easily wiped away. Someone with knowledge of what was on the test just had to find it -- which someone eventually did.

The fact that a test taker appears to have used his mobile phone and the Internet to cheat is, in and of itself, perhaps not too surprising. The fact that many kids are (generally speaking) more adept at using computers than most adults are is considered conventional wisdom is most places, and we shouldn't be surprised that
some students are able to exploit this basic asymmetry to cheat.

Wherever computers and the Internet are introduced into schools for the first time -- whether this in a suburban Canadian school in the 1990s or a rural school in South Asia in the 2010s -- run-of-the-mill 'copy-paste plagiarism' invariably sky rockets, and other, more inventive ways to cheat are subsequently discovered and put to use by students (a process enabled by the willingness of some to freely share their related 'expertise' via the Internet.) This is an issue that, in my experience working with education officials in high, middle and low income countries alike -- and almost without exception -- grows in importance over time as a preoccupation of policymakers charged with oversight of ICT/education issues within education systems.

In OECD countries, technical solutions to combat this sort of thing are increasingly in widespread use. Subscription services like turnitin.com offer schools an easy way to submit student work electronically to centralized databases; passages from the uploaded student work are then automatically checked for language that seems suspiciously similar.

Side note: About a decade ago, I talked with administrators at a very well known private international high school in Asia that had introduced an automated plagiarism detection service. These folks found themselves in a real quandary: Over 95%(!) of their students were found to have violated the school's honor code related to cheating, and according to school rules, the mandated punishment for the type of cheating that was detected was automatic expulsion. There was no practical way that this mass expulsion could occur, for reasons practical (there was simply not enough room at the school for the students to repeat the grade), political (students were from very prominent local families) and economic (the reputational hit that this school would have taken may have had disastrous consequences for the school’s ability to continue to operate -- which is why I have not named it here), so the school had to break its own rules and devise an elaborate compromise solution. Suffice it to say, it wasn't only the students who learned a valuable lesson in this case!

One way around such anti-plagiarism tools is for students to commission original work themselves -- a practice that the Internet makes quite easy, whether you are studying in the UK, Australia or points in between. Numerous sites exist for this purpose (I won’t give any of these services the benefit of a direct link here, despite the large amount of comment spam they regularly submit to this blog, but you should be able to find them pretty quickly using Google).
Copying an answer, or having someone else do your work for you -- I expect you would find few people who would consider this acceptable student behavior.

And yet ...

In an age where the 'outsourcing' of certain jobs and tasks is considered normal business practice, how should we feel about students who, for example, contract out their homework to well educated online 'tutors' based in places like India, Pakistan and Egypt? After all, in the corporate world, the initiative and management skills required to do this are lauded, and one of the primary rationales advanced in support of the widespread introduction of ICTs in school is that this will lead to the development of various sorts of skills valued in the workplace.

Last year, my boss had an urgent request for information to which I didn't know the answer, so I 'crowdsourced' it. I posted a question on Twitter, and within 30 minutes had three very good 'answers', all of which I quickly forwarded on. The fact that I was able to deliver in such a short amount of time certainly earned me points with my boss - who was later doubly impressed with my 'creative thinking' when I explained how I had actually come up with these answers in the first place.

While the context of my use of Twitter in this regard and the alleged use by the student sitting for his university entrance examination cited above are obviously quite different, the skill set and sensibility (if not the intent) behind both acts are fundamentally the same.

My point here is not to condone in any what what this particular student is alleged to have done in this case (based on news reports, he appears to have known what he was did was against the rules, and presumably felt that this was also wrong -- as is the case with young people in many other places who have engaged in similar actions). Nor is it to offer excuses for lazy kids in OECD countries who can afford to pay others to do their work for them.

It is rather to highlight some of the tensions that the introduction of new technologies into schools and broader society are having, challenging educators -- and in some ways, perhaps also some our larger views of what 'education' is meant to be.

In an age where computers and the Internet are in increasingly widespread use, it is easier than ever for students to 'cheat' -- and to get caught. The technological arms race in this regard between the policed and the police will continue to accelerate in schools, as it does in other areas in wider society.
In the particular case in Japan, one would expect that, at a minimum, mobile phones will be banned from examination areas (as they are, for example, in Korea). Viewed from one perspective, this would be a prudent, simple, overdue technical solution to a technical problem.

But there is a larger challenge here for education systems.

It is often noted that, if you transplanted a doctor from 100 years ago into a modern hospital, she would not recognize many of the practices and equipment in her new surroundings. Transplant a teacher from 1911 into a classroom today, however, and she would probably feel right at home, as little has actually fundamentally changed in the way that formal education is delivered in most places. The main difference, of course, is in the availability, use and impact of technology. As societies increasingly become saturated with new information and communication technologies, schools will slowly follow suit -- whether as a result of the actions and decisions of visionary leaders and educators, or because this is a wave that schools can only defend against for so long, the end result is essential the same, perhaps calling into question many current practices and beliefs:

- Where answers to simple questions are just a click or two (or web search result) away, what role should memorization of various facts play in the classroom?

- Where teamwork and collaboration skills are increasingly valued by many employers, and where the ability to introduce 'innovations' into business practices enabled through the creative use of new technologies is often what helps celebrate the winners from the losers in the business world, how should we evaluate our goals for the use of 'innovative' technologies in schools?

- What practices should we permit and which should we punish, which should we 'correct' and which should we celebrate?

By changing the 'art of the possible', the introduction of a variety of computer-related tools into the hands of students is forcing educators and education systems to consider, and re-consider, their answers to these questions, whether they like it or not.

Note: The image used at the top of this blog post ("a handy approach to finding the answers") comes courtesy of Hariadhi via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0
Unported license. Some of the links referenced above come courtesy of the very useful set of resources maintained by Trinity University's Bob Jensen.
16. Educational Technology Use in the Caribbean

by Michael Trucano
Originally published on Friday, 13 May 2011

Does the Eastern Caribbean education system adequately prepare youth for the global economy? This was a question posed by a World Bank paper back in 2007, which examined how some of the unique characteristics of small island developing nations in the Caribbean influence attempts to answer this question. The use of information and communication technologies within formal schooling systems is seen by many to be an increasingly relevant -- and important -- tool to impact teaching and learning practices across the region. In 2009 two publications from infoDev sought to document activities and progress in this area, and key policymakers from ten countries recently met in Barbados to take stock of where things stand and help chart a course for the future.

Barbados was in many ways an ideal place for such an exchange. The country's Education Sector Enhancement Programme (ESEP -- known in an earlier incarnation as Edutech 2000) has been perhaps the most far-reaching (and expensive) initiative to explore the use of ICTs in schools in the region.

The primary goals of ESEP have been to:
- Prepare students to be creative, numerate, literate and readily retrainable
- Ensure that all students understand the necessity of being able to live and work harmoniously with others
- Increase the efficacy of school by encouraging teacher to employ more forms of collaborative learning
- Prepare students to live and contribute in a technology-rich global society

In common with other large scale initiatives of this sort, the Barbados program has had to confront a number of challenges, including the fact that, once implementation had begun, it became clear that greater changes would need to be made to the physical infrastructure of many schools if they were to house computer labs successfully. Once computers were installed and connectivity established,
additional sets of challenges around computer maintenance and technical support quickly became evident.

While infrastructure challenges were important, in the end they are (given enough time and money) eventually solvable. Working with and supporting teachers as they explore how to change their pedagogical approaches to take advantage of the new technologies in schools has been in many ways a more profound challenge. In this, of course, Barbados is perhaps not unique -- either in the region, or globally.

This is not to say that there aren't challenges specific to the region. Consensus expert opinion from around the world, for example, holds that investments in ongoing teacher professional development and support are *crucial* if the types of changes in educational practices enabled by ICT use envisioned by educational leaders are to occur. The Caribbean sees some of the [highest rates of migration](https://www.nationsintransit.org/) in the world. This gives rise to a dilemma facing many policymakers across the region as they seek to roll out ICTs for use in schools: The importance of teacher preparation and professional development is well and widely acknowledged. At the same time, however, the more training teachers receive, the more likely they may be to migrate elsewhere (especially to the United States) in search of higher paying jobs. *If more (effective) ICT use in schools requires more highly qualified teachers, but more highly qualified teachers are more likely to emigrate, what is a policymaker to do?* This is a dilemma for which there are perhaps no immediate easy answers.

One group that is in many ways central to potential responses to such educational challenges is the [Caribbean Examinations Council](https://cxc.org/), the regional body that serves "to conduct such examinations as it may think appropriate and award certificates and diplomas on the results of any such examinations so conducted." The strong influence of the CXC exams on how education is delivered -- and assessed -- across countries in the region is one characteristic that marks the Caribbean as different from other parts around the world.

The 2009 [infoDev survey of ICT/education in the Caribbean](https://www.infodev.org/publications/2009-ict-education-survey) noted that "the tendency among the region's education systems to equate education with the preparation for exams, and the CXC exams in particular, limits the overall performance of education systems and also limits the potential contributions of ICT". While examination bodies and assessment schemes can be forces inhibiting change, this need not necessarily be the case. In a very well-received [presentation](https://infoDev.org/2009/CaribbeanICTeducation/presentation.pdf) at the Barbados event, and a very lively follow-up Q&A session, Dr. Didacus Jules, the CXC Registrar, provided a fascinating vision of how the CXC exams could be used to help transform the human resource competitiveness of the peoples in the Caribbean. Connecting the dots between various phenomena
observable in the region -- from widespread use of Facebook to the student learning and discovery enabled outside of school hours through playing of videogames -- and how ICTs can be used in a variety of ways to support (for example) activities promoting the development of critical thinking and skills valued in the marketplace, Jules outlined a version for the transformation of the activities of the CXC enabled by the use of ICTs that was in many ways a vision for the transformation of education across the region.

Translating compelling reasoning and impassioned rhetoric into something understood and implemented in practice is no easy task, of course. That said, people who are interested in how ICTs can bring about (positive) change in educational systems in various ways may wish to monitor what happens (or doesn't happen) in the coming years in the Caribbean. The stakes are high, and many of the challenges facing the small education systems of the countries of the Caribbean may appear to be seemingly intractable. If 'business as usual' will not get the education systems of the Caribbean where they need to go, quickly enough, new courses will have to be charted, and it is tough to see how ICTs won't be important, if not integral, to this process. "Be part of the journey", Jules advised regional educational officials at the conclusion of his presentation, and, while paths may be different for individual countries, regional cooperation will no doubt be critical if the destination is to be reached.

*Note*: The image used at the top of this blog post ("new horizons in the Caribbean?") comes from Flickr user Charlie Dave via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution 2.0 Generic license.
In the classic Ernest Hemingway novel *The Sun Also Rises*, Scottish war veteran Mike Campbell is asked how he went bankrupt. His answer: "Two ways. Gradually and then suddenly."

This pithy response is in many regards an accurate description of how the World Bank has considered of the use of mobile technologies as part of its support for international development efforts over the past decade. As part of its 'Innovation Days' event this week, the World Bank showcasing new approaches to some long-standing development challenges. Judging by many of the exhibits and discussions going on related to the use of mobile phones, it is clear that what was for a number of years a rather fringe topic of conversation among small pockets of people here -- primarily those working in the ICT sector and on microfinance -- has now exploded into the consciousness of World Bank and other international donor staff working in most sectors.

(It is perhaps no coincidence that the first person named as a 'World Bank Fellow' -- a global program announced earlier this year to tap new expertise into the World Bank's development work and strengthen its knowledge network -- is Michael Joseph, the former CEO of Safaricom, which has pioneered the use of 'mobile money' in East Africa through its popular m-Pesa program.)

A number of mobile phone-themed projects are being profiled as part of Innovation Days, including the use of mobile phones for real time data collection to support conditional cash transfer (CCT) programs in Latin America, to strengthen the supply chain for lifesaving drugs in Zambia as well as to improve both public services in Pakistan and farmers' risk mitigation in India. A few months ago the World Bank EduTech blog profiled some uses of SMS in education in the Pakistani province of Punjab. Uses of text messaging in the education sector in the neighboring province
of Sindh are being showcased at Innovation Days this week as well, and what is happening in southern Pakistan is in many ways representative of approaches and activities increasingly in evidence all over the world.

The "SMS for Better Schooling in Sindh" initiative is seeking to build bridges between government, schools and local communities as part of a wider effort to improve education services delivery. 400 schools are involved in an initial pilot project, which is utilizing text messages to inform schools and communities about things like the planned delivery of new textbooks -- and to check in to make sure that the textbooks have actually arrived and are in use. A number of other services are being monitored as well, including the state of lighting in classrooms and the quality of drinking water in schools. These sorts of things may not appear to be 'groundbreaking stuff', but, by raising awareness among local communities and different levels of the education system about their roles and rights, and by having government officials quickly exchange information back-and-forth with citizens on a variety of administrative matters via SMS, the project is seen to represent a significant improvement from past practices which, in the words of the project sponsors, were "characterized by virtually no direct information exchange".

As with the SMS education project in Punjab, this initiative in Sindh is taking advantage of the low costs of text messaging and the high penetration of mobile phones in local communities in an attempt to connect citizens with government in new ways as a way to improve the delivery of basic education services at the grassroots level.

Connecting people involved these sorts of initiatives is one of the goals of the newly announced Mobiles for Education for Development (m4Ed4Dev) Alliance, an international collaborative effort in which the World Bank participates between bilateral and multilateral donors, NGOs, foundations, private sector partners, academic researchers, and implementing organizations that is working "to explore cutting edge intersections between mobiles, education and development and to promote collective knowledge sharing". Following up on its successful research
roundtable at Stanford University earlier this year, in August USAID will be hosting an event in Washington, DC (supported by the World Bank and many other partners) as part of its leadership work with the Alliance around the theme of "Promoting Quality Educational Outcomes through Mobile Technology" (more information here). It is hoped that events like these will not only showcase promising practices in current projects, pilots and evaluations, highlighting initiatives from around the world that are largely occurring 'under the radar', but also inspire future innovation by bringing together representatives from innovative projects with potential funders and by catalyzing research to help inform current and future practices in this fast-moving field.

Note: The images used in this blog post come courtesy of the World Bank team working on the "SMS for Better Schooling in Sindh" initiative and are used by permission.
18. What's next for Plan Ceibal in Uruguay?

By Michael Trucano
Originally published on 10 June 2011

At a recent workshop in Montevideo convened by UNESCO and the IDB and hosted by Plan Ceibal on "The Role of ICT/Education Policy in Education Transformation", a new publication was unveiled that included short case studies of a number of countries -- including Uruguay. (This publication is expected to appear on the UNESCO web site shortly -- we'll add a link in the comments section below once it is available. Presentations from the complementary 'open seminar' are available here.) Later this year, the World Bank expects to publish a short case study looking at how Plan Ceibal has developed as an institution, and what some of the key issues might be for an organization like this going forward.

Why all the attention on what's happening in Uruguay, you may ask? Regular readers of this blog will know the answer, as the Uruguayan experience has been the subject of a number of EduTech posts over the past two years, and featured at a number of high profile international knowledge sharing events supported by the World Bank, the Inter-american Development Bank, the OECD and other international institutions. Judging by our server logs, we have picked up a lot of new readers in recent months, and so we thought we'd have another quick look at what is happening in the only country in the world where all students in publicly-supported primary schools have been provided with their own free laptop computer.

Now that (almost) all Uruguayan schools are connected to the Internet and work is well underway to put free laptops in the hands of all public secondary school students, Plan Ceibal is in many ways entering phase two of its ambitious initiative. The technical infrastructure is (largely) there -- the challenge now is to maintain it, to improve and enhance it, and, more importantly, to ensure that it is used effectively to support a variety of new and improved teaching and learning practices that will help Uruguayan students developed the knowledge, skills and attitudes to succeed in increasingly globalized, knowledge economies.
An important part of this challenge will be to make sure that teachers are supported and incentivized -- through sufficient technical support, relevant content, and more importantly, through a rich set of training activities, professional development programs and pedagogical support networks -- to take advantage of all that the new technological infrastructure offers, while at the same time becoming savvier about where doing things 'the old fashioned way' is still the most appropriate course of action.

**Phase two** of Plan Ceibal will not just be about 'more of the same, only better', however. An ambitious set of new programs and initiatives are now planned or underway as well, including:

- the conversion of all secondary and technical school (and some primary school) **science labs into 'digital labs'**, utilizing sensors and other 'probeware' devices
- the piloting of new educational **robotics curriculum**
- new **online nationwide mathematics contest**
- the expansion of pilot efforts in **online assessment** and evaluation
- a roll-out of Plan Ceibal into **kindergarten** classrooms on a voluntary basis (teachers submit plans to Ceibal for funding)
- the regular **refreshment/replacement** of OLPC XO laptops already delivered
- a new Plan Ceibal **Digital Library**, to include 100+ books and other educational materials (such as those from the Khan Academy), hosted on local school servers

(More detailed information on these and other activities is available on the Plan Ceibal web site -- those who don't read Spanish, or who are not comfortable using on-line translation tools, may wish to see a related post in English from the independent OLPCnews.com site.)

It will be interesting to see how Plan Ceibal evolves over time to accommodate these (and other) new directions. Presumably many of the activities in which it has been intimately involved over the past three years will gradually become the responsibility of the national education authorities. In many countries, the institutional structures initially put in place to get things started are often stressed over time as they attempt to accommodate, respond to and support local and grassroots initiatives if they are to remain relevant to the ultimate beneficiaries
(students, schools and local communities) -- and not just serve the entrenched needs of long-standing bureaucracies.

How can an institution -- and initiative -- like Plan Ceibal continue to be a force for exploring, introducing and learning from innovative new practices and technologies, while at the same time helping to sustain and extend its initial early successes?

In Uruguay a number of supporting initiatives have sprung up to support Plan Ceibal in various ways. Most notably, these include Flor de Ceibo, which coordinates the volunteer and research work of students and teachers from the Universidad de la República in support of Plan Ceibal; ceibalJAM!, an independent civil association formed by volunteers from Plan Ceibal to promote the development of free educational software and resources; RAP Ceibal, a loose network of over 1000 volunteers who help with technical support; and RUTELCO, the Uruguayan network of community infocentres. In many places, it is the vibrancy of connections to these sorts of 'supporting' volunteer and civil society initiatives that in the end help ensure the success of (or alternatively, doom to failure) large scale initiatives like what Plan Ceibal represents in Uruguay. By helping to 'fill in the (inevitable) gaps' in official initiatives, and through empowering large numbers of people and local communities who become important agents of both support and change, these sorts of activities can serve as important channels of information to inform future efforts and policies related to the use of ICTs to support a country's broader educational goals and objectives.

Many countries around the world are interested in the Uruguayan experience -- and in particular in the role of an organization like Plan Ceibal -- as a potential model to quickly 'jump start' their use of ICT use in education across the education system. In this regard there is much from the Plan Ceibal experience to date that other countries contemplating similarly ambitious initiatives would do well to learn from -- not only what has worked and what hasn't, but also why and how.

Perhaps even more interesting and valuable, however, will be the opportunity to learn from Ceibal's experience during its second phase of activities. How will it evolve over time? Will it be seen at some point to have outlived its usefulness within the system, labeled a 'success' and then shut down (some would argue that this is what happened to the UK's influential ICT/education agency, Becta)? Alternatively, will it be enshrined in law as a formal part of the educational establishment going forward indefinitely, leading, administering and exploring the use of ICTs in the education sector in seeming perpetuity (like has occurred with KERIS in Korea)? Or will it blaze a third path, creating a new model that other countries may wish to follow?
Only time will tell, but other countries currently considering embarking on ambitious new educational technology initiatives, as well as those seeking to consolidate gains from existing programs and projects and sustain them effectively over time, would be well-served to monitor what is happening in Uruguay.

Some related EduTech blog posts:

- What happens when *all* children and teachers have their own laptops
- How do you evaluate a plan like Ceibal?
- Uruguay's Plan Ceibal: The world's most ambitious roll-out of educational technologies?

*Note:* A growing set of educational videos are being produced as part of, and to support, Plan Ceibal. These videos can be accessed through numerous channels, including a dedicated catalog on the Plan Ceibal site and the Canal Ceibal on YouTube. The video used at the top of this blog post ("Impacto Ceibal") is used with permission of Plan Ceibal.
19. Reporting back from eLearning Africa 2011

By Michael Trucano
Originally published on 14 June 2011

eLearning Africa (eLA) bills itself as 'the premier annual event bringing together e-learning and ICT-supported education and training professionals from across the continent'. If you want a 'crash course' in what is happening in a variety of contexts related to ICT use in education in countries from Algeria to Zambia, you could do much worse than to attend this increasingly informative and useful event. This year the event was held in Dar Es Salaam, Tanzania and featured over 1700 participants (and over 300 speakers) from 90 countries around the world; it included daily plenary and 65 parallel sessions to share and debate emerging lessons from experiences in this fast-moving field.

As part of my work on the World Bank SABER-ICT initiative, I chaired a session at eLA 2011 dedicated to ICT/education policy development in Africa, which featured presentations by three of the leading groups involved in related advisory and research activities across the continent: UNECA (which has played an instrumental role in helping many Africa countries develop ICT policies); the PanAfrican Research Agenda on the Integration of ICT in Education ('PanAf', a research initiative of universities in 12 African countries, working with the University of Montreal); and the NEPAD e-Schools project. I was, to be honest, rather surprised by the strong attendance at this session (policy discussions can sometimes be rather dry), which was 'standing room only' over the lunch period on the final day of the conference -- especially given the number of other interesting presenters and projects being showcased in adjacent conference rooms. The fact that the speakers were well known, and that session was presented in English and French, no doubt contributed to the competition for seats in the room (which held about 80 people).

Presentations were deliberately short, leaving over an hour for discussion, but we did not have time to recognize all of the requests for comments/questions from the audience. I recognized lead ICT/education persons from at least nine different African ministries of education in the room, which suggests to me another potential reason why this session was so popular: this is now an area of tangible day-to-day...
relevance in many countries (most African countries still lack a specific policy related to ICT use in education -- despite the growing presence of computers in many schools and increasing recognition of the potential strategic importance of this topic going forward).

It was both heartening and discomforting to hear World Bank analytical work related to ICT use in education in Africa (the country survey work, the evaluation of NEPAD e-schools pilot project, and related World Bank EduTech blog posts) mentioned so often and prominently by both speakers and audience members in 2011: "heartening" in that it was good to know that so many people were familiar with it; "discomforting" in that this work (largely sponsored by the Bank's infoDev program) is still cited so often despite it being 4-5 years old. There is clearly huge scope and growing demand for regular, systematic and rigorous analytical work to inform policymaking in this area across Africa. Even where such work exists today, it appears to be a challenge for some of it to find its intended audiences. (The excellent PanAf project was not well known by most who participated in the ICT/education policy session, for example.)

(Parenthetically, I note that one strong message that emerged from the Horizon Report Africa brainstorming meeting -- more on that below -- was that Twitter may well be the medium by which one is best able to stay on top of developments related to ICT use in education across Africa.)

For me, the tone, substance and nature of many of the discussions at this year's eLearning Africa stood in contrast to past events of this nature in which I have participated -- in a good way. What was, only a few years ago, largely a general discussion about 'promise and potential', and about small and planned pilot projects, is clearly being transformed and enlarged to one about very practical concerns born of rich experience as well -- not to mention the hard choices about policy and funding trade-offs that come into play when considerations are made for related investments at scale. This change can (presumably) be attributed to the fact that many countries now have dedicated professional staff focusing on the use of educational technologies, and have embarked on (or are soon planning to embark on) fairly substantial initiatives in this area, often in partnership with increasingly sophisticated local NGOs. The high level officials (i.e. ministers and deputy ministers) with whom I spoke all appeared to be quite ICT computer literate themselves -- this stands in marked contrast to what I have observed anecdotally over the past decade, and this most likely also helped contribute to the greater fluency with which ICT-related topics were discussed, even at some of the highest levels. (Listening to one deputy minister talk about developing applications for Android, I couldn't think of a similar conversation I had had with a senior government official *anywhere*.)
Despite the sense of optimism that pervaded the event, and the clear sense that much was afoot across the continent at grassroots levels related to the use of ICTs in education, the fact that connectivity situation at the eLA conference centre itself was, well, not very good (to be diplomatic), was a small but constant reminder that many fundamental challenges remain. (Of course, it is not only at large e-learning events in Africa where wireless connectivity can be a challenge -- I have been forcibly 'off-line' at similar events in places like Seoul and Washington, DC as well.) At a conference focused on ICT use in education in 2011, with highly connected and tech-savvy participants, the symbolism here was quite potent, and points to both challenges and opportunities for the future.

That said, scratching under the surface a bit yielded a picture that was a bit more nuanced. In the 'early days' of eLA, it seemed to me that it was many of the people in attendance from outside Africa (NGOs, donor staff, vendors, academics) who seemed the most 'connected' during the event. In contrast, most of the Twitter and Facebook posts that emanated from this year's event seemed to me to be from East African participants using their phones to connect to local mobile networks; participants from other parts of Africa, and the rest of world, were for the most part largely un-connected during the course of the event sessions themselves, given the difficulties with the conference wi-fi network. One small scene I observed -- of two representatives of a European NGO asking their government counterparts from Kenya if they could quickly use their mobile phones to update their Facebook pages -- provided a small insight into one way in which the connectivity environment is transforming.

One exciting piece of news to emerge from eLA this year was the announcement that the well-regarded Horizon Report will put out its first African edition in 2012, with support from the the United Nations University (this first edition will focus largely on tertiary education). The Horizon Report (earlier EduTech blog post available here) is an influential annual publication that seeks to identify near term trends related to the use of educational technologies. Typically, 40-50 experts and leading 'influencers' and opinionmakers are engaged through a modified Delphi process to generate the content eventually published in each report. eLA provided a great opportunity for project sponsors to identify and connect with potential participants from across Africa in this process. It is expected that the final report will be produced by May 2012 -- hopefully in time for it to be featured at next year's eLearning Africa event.

Whatever the eventual utility of the Horizon Africa Report (and it is certainly expected to be very useful for policymakers across the continent!), the mere fact that an influential publication like this known around the world is now preparing to put out a special edition devoted to African ICT, learning and developmental
contexts will most likely be seen in many quarters as an important 'signal' that this both an area worthy of potential investment from the private sector, and that other policymakers, practitioners, academics and firms in other regions of the world may do well to include Africa in their scans of what is happening globally related to the use of ICTs in education. After visiting Dar Es Salaam this May, perhaps the same thing can be said for eLearning Africa itself.

Related blog post:

- [Education & Technology in Africa: Creating Takers ... or Makers?](#)

*Note: The image used at the top of this blog post ("badiliko kwa mjukuu uanze na babu") is (c) ICWE GmbH 2011 / Jonathan E. Kalan, PuraVidaPhots, Dar es Salaam, Tanzania and is used with permission of ICWE / eLearning Africa.*

96
20. One-to-one computing in Latin America & the Caribbean

by Michael Trucano
Originally published on Tuesday, 21 June 2011

A recent paper from Eugenio Severin and Christine Capota of the Inter-American Development Bank (IDB) surveys an emerging set of initiatives seeking to provide children with their own educational computing devices. While much of the popular consideration of so-called "1-to-1 computing programs" has focused on programs in the United States, Canada, Western Europe and Australia, One-to-One Laptop Programs in Latin America and the Caribbean: Panorama and Perspectives provides a useful primer for English-speaking audiences on what is happening in middle and low income countries like Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, El Salvador, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Trinidad & Tobago, Uruguay, and Venezuela. (There is of course a Spanish version available as well.)

While some of these cases are becoming better known globally -- most notably those of Uruguay and Peru, where the IDB has not coincidentally been quite active -- I expect many people from other parts of the world will be surprised to learn about the extent of activity in the region. Indeed, a lot is happening in the region. While the report does not aim to be comprehensive (indeed, ministry of education officials in a few Caribbean island nations have already noted that their 1-to-1 pilot initiatives are not included in the survey, and those knowledgeable about the field may note that there are, for example, programs from U.S. states that are not listed here), it does consolidate for the first time related regional information in one place for easy reference, while noting that "promising in concept, one-to-one initiatives thus far have had little implementation time and varying results."

While "one-to-one" may be new to many of the surveyed countries in Latin America, initiatives of this sort first started appearing about 25 years in the United States and Australia, and are increasingly widespread across Europe. (I have on my desk right now a copy of "One Computer for Every Teacher and Every Student", one of the first set of papers from the influential Apple Classrooms of Tomorrow (ACOT) project, which was published back in 1987!) When Severin and Capota state that "consistency between the objectives proposed and the achievements evaluated has
not been a strength of many existing One-to-One projects" in Latin America, they are flagging a challenge that has bedeviled many researchers interested in this topic for the past two decades.

Beyond the short useful sketches of individual country initiatives in Latin America, many of which utilize either the One Laptop Per Child (OLPC) XO device or the Intel Classmate, Severin and Capota are well aware of the lessons from one-to-one programs in other parts of the world and provide a strong reminder that, whatever the educational technology approach du jour,

*There is no silver bullet in education; in this sense, technology is no different from other learning interventions. The distribution of equipment alone will not have any effect on learning outcomes, unless it is considered as part of comprehensive reform processes, focusing on learning and explicitly proposes the change of traditional educational practices.*

Some have argued that this type of reminder should be self-evident. A criticism of this sort was levelled in some quarters about last year's Worst Practice in ICT Use in Education post on the EduTech blog, for example, which identified "dump hardware in schools, hope for magic to happen" as "the classic example of worst practice in ICT use in education" which unfortunately "shows no sign of disappearing soon". That such statements are easy to make doesn't mean that the related 'solutions' can be easy to implement. *Far from it, as some on-going experiences suggest.*

The authors conclude by stating that

*One-to-One models require much more than purchasing and distributing equipment to students. Their execution requires a long-term commitment to the conditions and components necessary to make them an integral part of education systems. Technology tends to augment pre-existing strengths and weaknesses. Rather than having an additive effect, the incorporation of laptops in schools often has a multiplicative effect. For instance, if a strength of a school lies in productive use of classroom time, then laptops will likely augment already productive classrooms. If a weakness of a school lies in unstructured or unproductive use of time in the classroom, then children are more likely to use laptops as an unproductive tool for distraction.*

(If indeed, I may add, they use them at all.)

*More and related information:*
• **One-to-One Laptop Programs in Latin America and the Caribbean: Panorama and Perspectives** is available for free download in PDF, ePub and .mobi formats in both English and Spanish.

• For those interested in some additional regional context, Guillermo Sunkel and Daniela Trucco recently wrote a paper for CEPAL on *New information and communications technologies for education in Latin America: risks and opportunities*.

• For many people, global 'best practice' related to the implementation of one-to-one computing programs can be found in the U.S. state of Maine. The Maine example is one that we highlight (and continue to learn from) regularly here at the World Bank as part of our advisory work with countries related to educational technologies (and through the occasional EduTech blog post as well).

• The IDB is exploring and documenting experiences in 1-to-1 computing through on-going projects in Brazil, Colombia, Honduras, Paraguay, Peru and Uruguay. It hopes to publish the next report in its on-going evaluation of the OLPC program in Peru this summer, and an evaluation toolkit for 1-to-1 projects in the fall. To stay up-to-date on these activities, you may wish to monitor the IDB ICT/education web site, unofficial blog, and/or Twitter feed, @Ini_Edu.

*Note*: The image ("uno") at the top of this blog post comes from Ecelan via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported, 2.5 Generic, 2.0 Generic and 1.0 Generic license.
21. What happens when all textbooks are (only) digital? Ask the Koreans!

by Michael Trucano
Originally published on Wednesday, 6 July 2011

A few years ago, a World Bank study highlighted the fact that there simply aren’t enough textbooks for most students in Africa, and what is available is too expensive. In response to this reality, some people at the World Bank have been exploring various options for addressing the ‘textbook gap’, including initiatives investigating the potential cost-effectiveness of ‘e-books’ for African students.

At the other end of the spectrum from the situation that exists in schools in many low- and middle-income countries in Africa, students in one East Asian nation may soon not have access to textbooks either -- at least the old fashioned, printed kind.

This blog periodically checks in with what is happening in Uruguay, as one way to help explore answers to the question, What happens when *all* children and teachers have their own laptops? In this small South American country -- the first in the world to provide free laptops to all students -- there is increasing interest in providing digital educational resources to students as part of the Plan Ceibal project, but there has been no talk (to my knowledge) of getting rid of paper-bound textbooks altogether. For that you would have to go to Korea, where the government recently announced that, by in 2015, all Korean textbooks will have been converted to 'digital' offerings.

The World Bank enjoys a very productive partnership with the government of Korea promoting knowledge exchange and applied research on educational technology topics. The highest profile example of this cooperation is probably the Global Symposium on ICT Use in Education, which takes place each year in November in Seoul. I expect that this year's symposium will feature lots of
questions from policymakers around the world about the bold decision in Korea to have all textbooks 'go digital' in a few short years.

The promise of digital textbooks (sometimes called 'smart textbooks' -- reasonable people disagree on what exactly 'smart' means in this context) has been discussed and explored for quite awhile, of course. I find that Alan Kay's influential work is well known among researchers in Korea who focus on educational technologies, and so antecedents of the recent announcement from Seoul can probably be found as far back as the Dynabook concept he introduced in the late 1960s. The educational CD-ROM boom in the late 1980s and 1990s in Europea and North America was heralded by many as ushering in a new wave of 'smart digital textbooks'. And today, of course, there is certainly no shortage of digital education resources available on the Internet.

That said, in no other education system (that I know of) has there been serious talk about getting rid of paper textbooks entirely. Until now.

Details are still a little sketchy about what this will all look like in practice. The Korean Education & Research Information Service (KERIS) -- essentially the country's national ICT/education agency -- has been piloting a 'digital textbook' project for the past four years. Al Gore's "Our Choice", a digital book distributed as an iPad app that was previewed in a much-talked-about TED talk earlier this year, points to some of the potential in the near future for what 'digital textbooks' may be capable of. While this is still many generations removed from the type of truly 'interactive' book imagined by science fiction writers (like Neal Stepheson famously did in The Diamond Age), the future may be closer than we think -- at least for students in Korea.

What a Korean classroom will look like after the new policy is now a matter of increasing speculation and interest in many quarters. Will digital textbooks simply 'replace' existing textbooks, providing 'jazzier' educational content, but be utilized by students and teachers in much the same way as paper-bound textbooks were in the past? Or will this be part of a more fundamental transformation in the way teaching and learning occurs? These are big questions for which there are no clear answers yet. Widescale introductions of ICTs in education systems are often meant to be spurs to transformation of existing practices -- although in the end, they often end up being used as part of, and thus largely reinforcing, 'traditional' activities and approaches.

This trend towards textbook digitization isn't only restricted to Korea, of course. (At the recent ISTE conference in the United States, for example, at least one major educational publisher announced its first 'digital only' textbook. ) But Korea is on the verge of going further than any other country has in this regard.
This movement will no doubt be a boon to creators of digital content in Korea, and to the (Korean?) manufacturers of devices on which such content is viewed / used / shared / created. Once entirely digitized, educational courseware in popular topics such as 'Korean maths', which is gaining in recognition in many other education systems, due in no small part to publicity around the high scores of Korean students on international standardized tests, may well be more easily adapted and 'exported' for use in other countries -- potentially opening up new markets for Korean educational publishers.

One thing that is sure is that there will be many unintended (and unforeseen) consequences -- there almost always are when new technologies permeate an organization or society. No doubt early many early commenters will be drawn to potential negative consequences, like potential issues related to privacy

   Student: I read that chapter after dinner yesterday but forgot what it was about.
   Teacher: Are you sure? From my admin screen here, I see that you did not access your digital textbook at all last night!

and security

   A headline no one wants to see: "Hackers remotely erase student textbooks".

While 'going all digital' might be a welcome development for Korean industry, what will the impact be on learning? Given that Korea already scores at or near the top of most comparative international assessments, its path to 'improvement' may not be as clearly defined as it is for policymakers in countries whose students score lower on such tests that those in Korea (or in other high performing systems, like those in Shanghai and Singapore). There is a big difference between having most textbooks available digitally and having them all available in electronic formats exclusively. From a global standpoint, will Korea enjoy a first mover advantage because of its choice to go 'all digital', and if so, what might this mean for Korean students, Korean companies, Korean schools, and, more broadly, for Korean society? Or will this bold decision saddle the Korean education system with additional (very large) costs that will inhibit its ability to innovate?

Few would dispute that, in the long run, most of the educational materials used by students around the world will be presented in digital formats. Of course, 'the long run' might well be very long indeed for many countries around the world. That said, policymakers considering ambitious plans to roll out educational technologies and digital learning resources in ever greater numbers in their country may do well to watch what is happening in Korea closely, both to learn about what 'works' -- and what doesn't.
Note: The image used at the top of this blog post ('banned in Busan?') is adapted from one that comes from Ali Moore (Dhscommtech) via Wikimedia Commons, used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
22. Using ICTs in schools with no electricity

by Michael Trucano
Originally published on Wednesday, 19 October 2011

One persistent criticism that I hear of educational technology projects in many places -- and especially in Africa -- is that 'there are too many pilot projects'. 'What we really need', or so the lament usually continues, 'are things that scale'. While I don't necessarily agree that more pilot projects are not useful -- to the contrary, I have in the past explored why we need more (not fewer) ICT4D pilot projects in education -- few would argue that we shouldn't be focused on finding 'solutions' that 'scale'.

One challenge that many groups find when trying to scale educational technology projects is that they often begin by working with relatively well-resourced schools in or near urban areas, seeking to establish proof-of-concept that something specific works (e.g. a technology, an approach to teacher training) before taking on the greater challenges of working in, for example, rural schools that are off-the-grid and which have few (if any) qualified teachers. It should perhaps not be so surprising that what works in the first set of schools may not work quite so well in the second set.

There are other groups who choose to start with the most difficult environments first, figuring that (1) that is where the need is greatest; and (2) if a model or approach works there, it might have a better chance of working (most) everywhere.

I am regularly contacted by groups who seek to work in such environments, but only rarely hear back from them with reports about what they are actually learning about working successfully in such environments (I do unfortunately hear a lot about failure), and how they are changing their approach or model as a result. One organization I have heard back from recently in this regard was Cybersmart Africa, a group I had initially learned about because of its innovative use of nylon sheets, PVC pipe, and a modified Nintendo Wii remote to assemble low
cost interactive whiteboards for use in schools in Senegal. Cybersmart Africa works exclusively in schools with classrooms with very poor physical infrastructure (including those with no or very limited electricity). "If this is the reality for 80% of schools in Sub-Saharan Africa, and we need to scale ICT use for education, why base what you are doing on what 10-20% of the privileged have?" asks Cybersmart Africa founder Jim Teicher.

(Another example of an approach designed to work in very difficult environments is so-called interactive radio instruction; this has been shown to scale well in many places, but, for a variety of reasons, has often proved to be difficult to sustain. One Mouse Per Child, which has also been profiled on the World Bank EduTech blog previously, is another.)

Many of the Western NGOs and firms with whom I speak who are interested in 'working in a developing country' start with a very high level or high concept approach, figuring essentially that, if the strategy is largely correct, the details will follow. (Indigenous groups and international NGOs with long experience 'on the ground' usually know better, of course.) Such groups can become frustrated when they discover that it is often an accumulation of 'small details' that ensure their particular approach or model does not work. It is better to walk than curse the road, or so the saying goes in Wolof, one of the languages used in Senegal, and this is an approach that the Cybersmart team seems to be following. When speaking recently with Teicher, one of the most encouraging things I found was that he first wanted to share information not about grand theories about what *might* work, but rather about a lot of the 'little things' they have been learning about what *doesn't* work, and about how iterating (and iterating, and iterating!) has been key to their ability to learn and make changes to their approach to methodically improve what they are doing. Things like:

- If you are off-the-grid and need to use batteries, don't used lead car batteries, which can cause big problems if/when they tip over, even if they are commonly available. Use sealed AGM batteries instead.

- Let's be honest: In most cases, there are too few computers in a school for too many students, and it is difficult to integrate their use into normal instruction. Don't make things more difficult by segregating computers into their own special rooms (e.g. computer labs). Instead, take the technology to the teachers and students where they are currently teaching and learning -- in the classroom itself -- and use tools like projectors and interactive whiteboards that impact as many students as possible at one time. (While you're at it, be prepared to spend more on teacher training and support than on the technology itself.)
And:

- Given a choice (and there is a choice more often that you might think!), always search for local products (or, barring that, products that can be assembled locally) instead of immediately looking to import goods from abroad -- this can be key to keeping costs down and keeping your supply chain as local as possible. This approach applies as much to the PVC material that they use for the portable 'interactive whiteboards' that they have assembled as to lesson plans, which are developed locally.

Sounds simple, you might say, to which I would say: you are exactly right.

Now, it is not my place or intention to do so here to 'endorse' the work of any particular organization (I'll note parenthetically that World Bank has not supported this particular project in the past -- although USAID has).

Rather, it is to highlight an approach which begins by working in the most challenging environments and not simply taking a model that worked successfully in Paris or Pretoria and assuming that, with some small modifications here and there, it will work everywhere. That's common sense, you might say, and I would certainly agree. But, if the parade of groups who (seek to) pass through our offices here at the World Bank demo'ing their wares are any indication, and the many stalled projects I visit around the world are in any way representative, too often 'common sense solutions' are discarded in favor of what's 'new and exciting'. While funding what's new and exciting may be fashionable for donors (should I be surprised that every other project proposal I seem to come across these days seems to include
the use of mobile phones in some way?), in the end that it is usually the most practical solutions that find traction with teachers and students over time.

More information (short videos):

- Here's a short [promotional video](#) from Cybersmart Africa showing off its work. (A hint: watch it first with the sound off to focus on what classrooms in participating pilot schools actually look like)

- Here are some [interviews with school leaders](#) (don't turn the sound down on this one!) and a short explanation of how text messages (SMS) are being used in conjunction with low cost interactive whiteboards to support teachers.

- Cybersmart has also posted [17 student-made videos](#), put together as a result of a special 'digital storytelling' initiative it sponsored. The idea here was first to gain the confidence and support of parents and community leaders by extend traditional storytelling customs into the digital realm, before moving on to other things. The result: 17 portraits of contemporary village life in Senegal.

Note: The image used at the top of this blog post ("interacting with a whiteboard (in front of a blackboard) in Senegal") comes courtesy of Cybersmart Africa. The second image ("moving a low-cost interactive whiteboard -- over rocks and sand -- between classrooms") is taken from a screen capture of the 'Snapshot – Cybersmart Africa' video [on YouTube](#). Both are used with permission of the rights holder.

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(... And so the World Bank EduTech blog resumes its regular publishing schedule. Thanks to all of the people who have written in over the past months asking when the blog would be active again -- here's your answer.)
23. Surveying ICT use in education in Brazil

by Michael Trucano
Originally published on Tuesday, 25 October 2011

An on-going series in the *New York Times* ('Grading the digital school') is exploring the impact of educational technology programs in U.S. schools. One recent article in this series noted that "Hope and enthusiasm are soaring here. But not test scores." This phenomenon is not limited to schools in rich countries like the United States, of course:

"Although the government has invested resources in ensuring the broad use of ICT in education, the results of this use in meeting the goals and targets of educational programs are, however, virtually unknown."

This statement, which could apply to scores of countries around the world, can be found near the very start of *TIC Educação 2010* ("ICT Education 2010"), a fascinating new survey on the use of ICTs in Brazilian schools.

Reasonable people can (and do!) disagree about how various approaches to testing and assessment can provide insight into the utility and the impact of the use of a variety of ICT tools (computers, interactive whiteboards, education software applications) to help improve 'learning outcomes' and the development of so-called '21st century skills', and numerous high-profile groups are proposing that we think about these issues in new ways. Even if we know what skills and knowledge we want students to develop and acquire, disentangling what role (if any) the use of ICTs might play in this process can be very difficult, given the great number of other factors that are at play. This is especially true when we don't have basic data about the extent to which ICT tools are actually available and being used for learning purposes, inside and outside of school.

Through projects like Proinfo and, more recently, the Broadband in School program (PNBLE), various levels of the government have encouraged the roll-out and use of ICTs in Brazilian schools since the mid 1990s. By sampling 500 schools across various regions of the country, "ICT Education 2010" attempts to provide a
pretty comprehensive snapshot of what the current school technology environment looks like.

One model for funding ICT/education monitoring surveys
How can we fund monitoring and evaluation activities related to ICT use in education? While, at a conceptual level, few policymakers would say that "more M&E" would not be useful, when it comes to actually having to make tough choices about how to pay for such things, enthusiasm often wanes. With general education budgets so tight, and often a limited ability to tap scarce discretionary funds, are there other ways to fund activities of this sort outside of normal funding processes overseen by the ministry of education?
In Brazil, monies raised through registering domain names and distributing IP addresses have helped to fund research activities attempting to produce useful data that can inform public policy decisions in a number of areas related to the use of the Internet. Produced by CETIC.br in partnership with a number of other groups, "ICT Education 2010" is one result of this social compact.
Might this be a model that other countries could explore?

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Some quick highlights from the data-rich report:

Schools
40% of public schools surveyed do not participate in any government programs related to ICTs, which mainly focus on infrastructure. Most computers are found in school computer labs. The average school has 23 computers, with some notable regional variations (27 per school in the South, 19 per school in the Northeast -- there is a lot of regional variation in Brazil), although, as a practical matter, only 18 are in use (a functional reduction of 22%), for a variety of reasons. Broadband (in this context: 1Mbps) connections are found in 87% of schools that have an Internet connection.

Teachers
Most teachers (90%) have a computer at home, usually with an Internet connection (81%), and report using this equipment more often at home than they do while in school. About half of all teachers who have a computer have a laptop, one-fourth of them as a result of participating in various special programs designed to promote computer ownership by teachers. Despite widespread computer ownership by teachers, however, school 'directors of studies' felt that only a minority of teachers were able to use applications beyond basic web browsers, social networking sites and email to impact teaching and learning.
Interestingly, most teachers feel that the most significant support for their development of technology skills coming from informal communications they have with other teachers. Is this a result of inadequate formal teacher professional development programs (only 53% of schools report involvement in teacher training programs in this regard), or because this is simply a better way for this support to occur? The survey doesn't offer much insight in this regard, but, as it does in many other areas as well, it does raise some interesting follow-on questions.

**Teaching and learning**

Teachers (and especially younger teachers) appear to use the Internet most for lesson planning, but much less as part of in-school learning activities (perhaps not so surprising, given that only 2% of students report having daily access to the Internet at school). 69% of students have never done a science experiment with the use of ICT, 55% have never used ICT to do a presentation in class, and 82% have never communicated with their teachers over the Internet.

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This is just a flavor of the types of data available in 'ICT Education 2010', which contains over 100 pages of tables and charts. It is not clear to what extent raw data from this survey is available to interested researchers, but one suspects, given movements towards more 'open data' and transparency in Brazil, this may come in time as well. What is clear is that a lot of fundamental challenges remain related to the integration of ICT tools into daily educational practices in Brazilian schools, despite almost 15 years of concentrated effort in this regard. Together with insufficient technological skills, basic access to technology is still seen as a challenge (and this challenge, of course, is a barrier to the development of such skills). The survey finds that school leadership, and the general school environment, 'are critical to the integration of technology in education', noting that 'one cannot expect that teachers alone promote possible changes in the paradigm of education [ed. note: this is the holy grail of most educational technology programs], including the integration of digital culture into schooling'.

The report itself does not offer too many conclusions, instead offering up a great deal of data that will provide much food for thought among policymakers and researchers in Brazil (and perhaps elsewhere as well -- CETIC's decision to publish in English as well as Portuguese will no doubt help in this regard). Some -- in fact many -- of the conclusions that are offered may not be too surprising, but 'ICT Education 2010' provides rigorously collected data to help begin to provide an evidence base supporting such conclusions, while at the same time raising additional questions that will serve as inputs into future versions of this survey.
work. By doing so it will no doubt make a valuable contribution to policymaking discussions in Brazil in ways that other countries might do well to emulate.

For more information:
You can download the full report (which also contains a number of essays by noted Brazilian academics) as a PDF document through the CETIC web site. CETIC has just published its ICT Households and Enterprises 2010 survey as well. Both are available in Portuguese and English.

Note: The image used at the top of this blog post of a school in Alto Paraíso de Goiás ("Brazilian students queuing for their daily bread -- will their daily Internet be far behind?") comes from UNiesert via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
24. Can you really teach someone to read with a computer alone?

by Michael Trucano
Originally published on Monday, 31 October 2011

For a few years, the World Bank’s infoDev program has sponsored a monthly online 'EduTech Debate' (ETD) which functions as a sort of rough complement to the Bank's own EduTech blog. The goal of the ETD has been to provide a forum for the sharing of information and perspectives on various emerging topics related "low-cost ICT initiatives for educational systems in developing countries". From the very start, the World Bank's role -- and certainly our voice (to the extent that we have one on these topics) -- has been in the background, and, by design, one only rarely sees a World Bank staff member post on the site, or contribute a comment to the sometimes lively exchanges of opinions that individual posts ignite. We do follow the discussions quite closely, however, and sponsoring the debate has been a useful way for infoDev, the World Bank and UNESCO to be tuned in to some conversations we might not otherwise know are occurring, and to connect with interesting organizations and practitioners doing interesting things around in the world.

The most recent debate has looked at the potential role that ICT can play in promoting the acquisition of basic literacy skills. Especially in places where literacy levels are very low -- where the formal education system has, in many significant ways, failed in one of its fundamental roles -- might ICTs offer some new approaches (and tools) that can help get children reading? Noting (for example) the large number of very basic iPhone apps targeted at children in OECD countries to teach basic letter recognition, phonics, and vocabulary, an increasing number of groups are exploring doing similar things in less privileged environments. But is it really that easy?
Some highlights from the October 2011 Edutech Debate:

Carmen Strigel of RTI International talks briefly about what we know (and what we don't) about 'ICT and the Early Grade Reading Assessment: From Testing to Teaching'. Together with other partners, RTI has been exploring the use of EGRA in scores of countries (and even more languages). While the use of handheld ICT devices by the learner herself has generated the most enthusiasm in some quarters, Carmen talks about how ICTs can be used in test creation, data collection and analyses phases of EGRA projects as well.

Victor Lyons remarks that 'The Bottom of the Pyramid needs Reading ICT Solutions too', drawing on a computerized literacy program he developed and deployed in India.

Charles Callis looks at one specific product as part of his discussion of 'Improving Reading Skills Through Personalizing Literacy Instruction'.

Jim Teicher and Sarah Nehrling of Cybersmart Africa (recently profiled on the World Bank EduTech blog here) write about 'ABCs and ICTs: Delivering Scale and Value with a Whole Class Learning Solution', based on experiences in Senegal. They note (quite sensibly) that "it is essential to keep in mind that ICT use in schools will accomplish very little if not integrated within a toolbox full of supporting educational content, ongoing teacher training and support, and a context that nurtures evolving teaching and learning styles".

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In my position at the World Bank as the 'educational technology guy', I am approached pretty much every week by someone or some group touting their language learning software, saying that it is 'exactly what is needed in [insert name of country or continent]'. (For what it's worth, the most common word inserted at the end of such declarations is 'Africa', in my experience.)

Now, a lot of this stuff is pretty good. Quite good, in fact. That said, when I ask what sort of user testing they have done with their purported target groups (some examples from recent pitches I've heard include refugee communities fleeing conflict in Africa, street kids in Central America, and out-of-school girls in rural communities in South Asia), and to what extent the development of their device and/or software application has been informed by what they have learned from working with such groups, tailored to the specific learning contexts for children in those places, I rarely hear compelling responses that indicate to me that most of
these folks really 'know their customer’ to any great extent. You could argue, I suppose, that their customer isn't really the end user, but rather funding institutions -- international donors, foundations and NGOs, education ministries -- who would buy such tools to be used by others. If so, you might well, as a practical matter, be right, but that wouldn't change the fact that such tools are often ill-designed to work well for such learners -- if they work at all.

In a comment on the Callis post on the EduTech Debate site, Isabelle Duston highlights a problem common to many 'new' initiatives in this area: They seek (for example) to use software that was created to promote literacy in native English speakers in order to teach non-native speakers how to learn English as a second (or third, or fourth) language -- even where such people aren't yet literate in their first language! It may be true that, in some exceptional cases, you will find kids who can pick up literacy skills in such contexts. (Indeed, in my experience, many pilot projects actively seek out and highlight such exceptional cases to illustrate the success of their overall approach.) That said, we shouldn't be surprised when the result is that such projects have little or no real impact.

This is not to say that ICT holds no promise to promote the acquisition of basic literacy skills. To the contrary: It may be in this regard that ICT use can have the most transformative impact on millions of learners around the world in the years to come. Same language subtitling of movies and television programs, for example, has been shown in certain circumstances to promote reading skills in countries as varied as Finland and, perhaps most famously, India.

Marije Geldof's recent PhD thesis ("Literacy and ICT: Social Constructions in the Lives of Low-literate Youth in Ethiopia & Malawi") highlights the fact that "the perspectives and experiences of low-literate users in such contexts have previously received insufficient attention." In a few weeks USAID is expected to announce its next Grand Challenge for Development, this one focused on getting all children reading, and explorations of how ICTs (especially 'mobile devices') can be used to help promote the acquisition of early literacy skills will most likely be one component of this new initiative. It will be worth watching what develops as a result.

Note: The image used at the top of this blog post of the title page of a book by Louis-Gustave-Fortuné Ratisbonne ("one technology to teach reading still works pretty well ...") comes via Wikimedia Commons; it is in the public domain.
It's fine to celebrate success but it is more important to heed the lessons of failure, Microsoft founder Bill Gates is meant to have once remarked. Those of us who have worked for any period of time on educational technology projects, or on international development projects (let alone in the space where these two areas meet!), will have come across at least one project that 'failed' -- and perhaps did so spectacularly. How might we learn from such failures?

One way to do this that is gaining traction in increasing numbers of organizations is a FAILfaire. What is a FAILfaire, you ask?

In the words of the MobileActive NGO, which has been a big proponent of the approach,

"While we often focus on highlighting successes in our field, it’s no secret that many projects just don’t work – some don’t scale, some aren’t sustainable, some can’t get around bureaucratic hoops, and many fail due to completely unanticipated barriers. At FAILFaire we want to recognize the failures: the pilots that never got anywhere, the applications that are not delivering, the projects that are not having any measurable impact on the lives of people, and the cultural or technical problems that arise."

Writing on the World Bank's Education for Global Development blog, Ariel Fiszbein, the World Bank's Chief Economist in the Human Development Sector (which includes health and education), notes that "Publicizing what doesn’t work is a fundamental part of any approach to evidence-based policy. Lack of results is a likely outcome of any innovation. We should remain open and even celebrate those that bring us the bad news as they are helping us stay honest."

Or, in the words of the Dutch Institute of Brilliant Failures (there really is such a thing!), "sharing lessons from what hasn't worked can stimulate entrepreneurial thinking and behavior (in the broadest sense of the word) by encouraging people to
develop new ideas and enabling innovators to turn ideas into reality". Such efforts could be wasted in a culture where failure is seen as shameful and few are prepared to take risks. A FAILfaire -- a term that appears to be novel enough that it is still not in Wikipedia -- is one small attempt to help change such a culture.

OK, you might say, I'm with you so far. Conceptually what you say makes a lot of sense. But what is attractive in the abstract can become decidedly less so when you try to translate such laudable sentiments into actual practice.

The World Bank has hosted three FAILfaires in the past 15 months or so: two were open to the public (we wrote about the first one on the EduTech blog, ICTworks recently posted a wrap-up of the second), and one was a strictly an internal affair. In the past week I have been asked by three different organizations for advice on setting up an internal FAILfaire. While it is always flattering to be asked for advice, I must admit being seen as a 'go-to guy on failure' does leave me a little conflicted. So be it: In case it might be of interest to any other organizations, I thought I'd quickly share some of what I've learned about how to run FAILfaire events, based on my own personal experience as both organizer and participant, and as a result of discussions with my colleague Galina Voytsehovska, whose excellent short paper on this topic recently won an internal knowledge management award here at the World Bank.

First, it is important to note that we used the excellent general FAILfaire template put together by MobileActive. Everything that is described below owes a tremendous debt to the innovative thinking and direction that the good folks at MobileActive have provided in this area. If you're interested in hosting your own FAILfaire, I'd suggest you first have a look at the MobileActive guidelines, and then come back to this blog post here. For our context, doing a FAILfaire as an internal event meant that we had to change a few things -- and we introduced a few additional new 'innovations' as well. (Some worked well ... some didn't. See below.)

An important caveat: It was important to note that at no point were we really 'celebrating failure' (this is a goal expressed by some FAILfaire organizers). While I understand the intention that is meant to be embedded in this phrase, this is a rather dangerous (and incorrect) formulation in many contexts, I think, for a number of reasons. Our goal for the event was to provide a space where could celebrate taking risks and the open and honest sharing of information (even and especially about what doesn't work or isn't working) so that we could learn from these things.

In many of the types of institutions that could perhaps most benefit from open discussions of 'failure', enthusiastic rhetoric about 'celebrating' mistakes might well be counterproductive.
It is possible to talk with colleagues and peers about things that haven't worked in an informal way while at the same time not losing fact of the fact that much of what is being discussed is serious business, with serious consequences for mistakes and failure of any sort.

"Celebrating failure": Such language may be catnip to critics of your organization or the industry in which you work -- as well as to people looking for sensational headlines and posts on Twitter. It can also be difficult to get some managers to agree to let their staff participate an event with this theme. (I discussed this concept with one person whose response was: 'My employees are free to celebrate their failures -- if they wish to do so, they will have a lot of time for this as they are standing in the unemployment line./)

With that in mind, internal FAILfaires might wish to have the following two core general objectives:

- to draw lessons from experience and see how it may be useful for other colleagues who are working on similar projects;
- to foster more open dialogue among staff about how to identify and respond to project challenges of various sorts, in the hopes of making them more successful.

Our seven ground rules (adapted from the MobileActive FAILfaire guidelines) for presenters were:

1. No names (i.e. you can't talk about other people by name; as a gimmick, we referred to all presenters by only their first name and last initial, e.g. "Mike T.").
2. No blame (you can't blame others)
3. No recording (including no webcasting, no blogging, no live Tweeting of identifiable information, no archiving of presentations on the Intranet)

4. You can only speak about projects you worked on

5. **Chatham House Rule** applies

6. 7 minute time limit per presentation

7. Audience participation required

We advised presenters that they were free to change the names of anything in the project they were to discuss. We did not have an open Q&A session, in an attempt to limit 'speechifying' from the audience as well as to avoid situations where audience members don't follow the same rules that presenters are using and try to name names, assign blame, etc. The idea here was to help make the presenters feel as comfortable as possible, and to lessen the opportunities for cranks and trolls (in the *Internet sense of the term*) to be disruptive influences.

We were very strict about the seven minute time limit:

- An electronic clock (actually an iPad running a stopwatch app) was set up directly in front of each presenter to help them keep track of time.
- Slides were set to auto-forward and change after 1 minute (presenters were free to advance them more quickly if they wished).
- We used a large Chinese gong to signal the end of each presentation (this would get progressively louder each time we sounded it, eventually drowning out the presenter, at which point the audience was prompted to applaud enthusiastically).

Presenters were asked to prepare a single question for audience response; the audience then used handheld voting devices to 'answer' each question in real time immediately upon the conclusion of each presentation.

We were able to recruit ten brave souls as presenters for our internal FAILfaire. We made sure to have an equal number of men and women, so as not to associate 'failure' too closely with one specific gender. (That said, we did find it interesting that it was much more difficult to recruit men as presenters than women, a fact which occasioned a rather lively discussion in its own right.)

For what it's worth:
1. Convincing people even to participate was a rather herculean task. The three 'worst' presentations (or so I've been told) were from people who were among the first to agree to participate. The more people we added to the agenda, the easier it was to convince others to join in. (Frankly, I think having even 'bad' presentations is not such a big deal -- as long as there aren't too many -- as the whole point is to promote/foster a culture of sharing, and if everything is too slick, this may intimidate some staff, who may be less likely to volunteer to participate in future sessions).

2. As noted above, we used a gong to try to keep people to their seven minutes. Most did (only one person had to be gonged multiple times -- seven separate times in total before the plug was pulled!).

3. In between presentations, we put up slides with quotes about failure.

4. Stage management is a real issue when you try to move things along as quickly and cram in as many people as we did. This is something that should definitely be rehearsed beforehand. We had a number of glitches in this regard.

5. We used interactive response devices ("clickers") as a way to solicit audience feedback. These are handheld polling devices that you can use to respond to multiple choice questions displayed in a specially prepared PowerPoint presentation. As we did with the fast pacing, we had some implementation challenges with this, but it something to consider, as it is a potentially valuable tool to help quickly engage with an audience limited way.

6. Following on the excellent example from the summer 2010 FAILfaire organized by the World Bank Institute (WBI) and MobileActive, we tried to adopt and promote a very informal, friendly presentation style. (One 'joke' that seemed to go over well was repeated references to the 'F word' ... by which I meant 'failure', of course, but we let this hang in the air for awhile.)

7. We promised the presenters that we would not make the slides available after the event. Nothing was archived on the Intranet. No tape was made. The internal bloggers did not blog about it. These were concessions to secure people's participation. We would have preferred to share more information, more widely ... but our first priority was to make the presenters feel safe and supported.

8. Some of the people who OK'd the internal FAILfaire were a bit worried about the event. To be honest, I don't think a number of these folks exactly understood what we planned to do. (We were, for example, asked not to use
the word 'failure' in the title, and to 'focus on success'. We, um, accidentally forgot to do these things.)

9. A number of people pre-cleared their presentations with their managers -- something which we encouraged.

10. We went out of our way to ensure participation by very senior and well-respected staff members in the event to make opening remarks. In addition to the content of what these folks said (which was excellent, of course), we wanted to show that there were senior, well-respected staff involved in the event, which was meant to implicitly signal support 'from the top'. Many people have said things to the effect of "you should have had more managers, etc. involved". Yes, that would have been great, but we did the best we could. (For those seeking to do something like this within their own organization: Good luck to you on this count.)

The feedback I've had from people who participated in the internal FAILfaire has been very, very positive. Are things like a FAILfaire the answer to promoting greater openness and transparency within an organization? Of course not, but as part of a larger concerted effort towards promoting more sharing of information within an institution, something like this can perhaps be quite useful. It can also be used to help energize younger staff: Interestingly, there appeared to be a bit of a split by 'seniority' of people within the institution. Generally speaking, the reactions I had from folks under, say, age 35, contrasted quite a bit with those from staff over age fifty (read into that what you will).

So: If you're interested in running your own internal FAILfaire,

    Good luck.

    (Please make different mistakes than we made.)

And, as they like to say in Silicon Valley:

    Fail forward, fail fast, fail better!

You may also be interested in:

- My colleague Galina Voytsehovska, with whom I worked on the internal FAILfaire event, won first prize in the IFC's 'Smart Lessons' competition for her essay on How to Discuss Failure—and Not Get Fired! Lessons from a 2011 Human Development Forum Session. If you want additional background and guidance based on our experience with this internal FAILfaire event, Galina's essay is highly recommended.
• For a (somewhat) contrary view on this stuff, you may wish to have a look at Jason Fried's Learning from failure is overrated post on the always engaging 37Signals blog (be sure to have a look at the comments section too).

"There are no secrets to success. It is the result of preparation, hard work, and learning from failure." -Colin Powell

Note: The image used at the top of this blog post of a train wreck at Montparnasse station in Paris ("epic fail") is in the public domain and comes courtesy of Wikimedia Commons. The image of the warning sign in the middle of the blog post ("FAILfaire organizers are encouraged to plan ahead and anticipate danger areas") comes from Paul Downey via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution 2.0 Generic license.
26. e-Learning in Korea in 2011 and beyond

by Michael Trucano
Originally published on Wednesday, 23 November 2011

Each year the World Bank helps sponsor an annual global symposium on ICT use in education for senior policymakers and practitioners in Seoul, together with the Korean Ministry of Education, Science and Technology (MEST) and the Korea Education Research & Information Service (KERIS). This is one important component of a strong multi-year partnership between the World Bank education sector and the Republic of Korea exploring the use of ICTs in the education sector around the world. This year's event, which focused on Benchmarking International Experiences and was about half the size of 2010's Building national ICT/education agencies symposium, brought officials from 23 countries to Korea to explore how technology is being used in schools around the world (previous blog post: Eleven Countries to Watch -- and Learn From), with a special emphasis on learning about and from the Korean experience.

Specifically, there was much interest in learning more about two news items that appeared since last year's event: Korea's top place in an international digital reading assessment and the country's bold plan to move toward digital textbooks in all subjects at all levels by 2015.

Back in June, it was announced that Korean students finished at the top of an OECD PISA survey that attempted to assess how well 15 year old students use computers and the Internet to learn. (For those who aren't familiar with PISA, this short animated video does a great job of explaining what it is in an engaging and understandable way.) This particular test challenged students to "evaluate information from several web-based sources, assess the credibility and utility of what they read, and navigate across pages of text autonomously and efficiently". Korea was the top-performing country according to this conception of 'digital seeking protection from all that cheap bandwidth!
reading' -- by a significant margin! (Interestingly, Korean 15 year olds performed much better in 'digital reading' than they did with old fashioned printed materials.)

How to interpret these results will no doubt occupy researchers and policymakers intensely in the coming years, but there appears to be little doubt that *something* interesting must be going on in Korea. *Just what is it?*

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Given these impressive results on measures of 'digital reading', one is often initially surprised by the low apparent use of technology when one visits many Korean schools. I have accompanied policymakers and international experts on visits to Korean schools for each of the past six years, and many first time visitors have the same reaction: *Where is all the technology?* Visit a school in *Uruguay*, and the technology (in the form of little green laptops that each student owns, paid for by the government) is hard to miss. Visit a South Korean school, however, and the lasting impression of technology use is usually a television at the front of each classroom utilized as a computer monitor for a teacher to present information to her students.

How come Korean students score so well on international measures of 'digital reading', then?

If you want to see Korean students using technology intensively, wait until the school bell rings to end the day and watch kids once they leave school grounds as they reach into their backpacks to switch on their mobile phones -- or head to one of the many Internet cafes where you'll see kids gaming -- or pop into one of the "cram schools" that provide after-school tutoring to Korean students beginning at a very young age and increasingly aggressively market their use of technology in attempt to woo families to pay for their services. Or, even better: Go to a Korean home, which enjoys by many calculations the world's fastest Internet connections. It is not difficult to imagine that many students spend more time at home using the government-sponsored *Cyber Home Learning System* than they do using computers at school.

Speaking about findings across countries, and not just Korea, the OECD researchers found that, "After accounting for students' academic abilities, the frequency of computer use at home, particularly computer use for leisure, is positively associated with navigation skills and digital reading performance, while the frequency of computer use at school is not. These findings suggest that students
are developing digital reading literacy mainly by using computers at home to pursue their interests."

Many policymakers in Korea are well aware of these findings, and are exploring ways of bringing the 'revolution' that ICT is bringing about in larger Korean society into schools in a big way. Korea has been actively 'computerizing' schools for the last 15 years or so, but, for the most part, computer use appears to have had little fundamental impact on the way teaching and learning happens in schools. (In this, of course, Korea is not alone.) For this to happen, Korean policymakers argue, what we need is 'Smart Education'.

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Digital textbooks (a topic also covered in an EduTech blog post from earlier this year) are an important component of Korea's new Strategy of Promoting Smart Education, which will also will see increased efforts on blanketing Korean schools with high speed wireless networks and moves to more computer- and Internet-based assessment. KERIS -- essentially the country's national ICT/education agency -- has been piloting 'digital textbooks' in various forms for the past four years or so in preparation for the move by 2015 to using digital textbooks in all schools in all subjects at all levels, something which the BBC recently heralded as "opening a new chapter" in the story of Korean education.

In the words of KERIS, "Digital Textbook is 'the textbook of future' which provides various interaction functions with students to study anytime, anywhere and it also contains references books, workbooks, learner's dictionaries, notebooks, and existing textbooks as well."

It is not one specific device -- indeed, the idea is that digital textbooks will be accessed/viewed on many different things, from tablets to desktops to laptops to phones (and, just possibly, on devices not yet in widespread use in education). At this year's global symposium, a digital textbook was demo'ed on an iPad; the KERIS school-based pilot program used tablet PCs. The Korean Digital Textbook site outlines the features and affordances of the planned 'digital textbooks', comparing them with the old fashioned paper kind. An informative presentation [pdf] at the global symposium outlined where Korea may be going with its digital textbook initiative between now and 2015, while noting that many challenges will need to be overcome, including the inevitable resistance at the classroom level to large-scale change efforts. Research from the KERIS pilot programs found very small impact on educational outcomes and there are understandable worries about how to ensure positive returns on what will undoubtedly be very heavy investments in technology in the coming years.
While many if not most other countries look on Korean performance on international tests like PISA with envy, in Korea itself there appears to be -- at least based on presentations at this year’s symposium -- an intense pressure to do better. Indeed, one of the real strengths of the Korean education system may be that so many parents express dissatisfaction with parts of it, and thus constantly challenge government, schools, and their children to do better. How do you improve a system that already appears, at least based on comparative international assessments, to be so high performing? 'Smart Education' is one attempt by Korean policymakers to help answer this question.

Some international observers may argue that Korean 'smart education' seems to be largely about improving the technical infrastructure for the education system. This may or may not be true -- only time will tell. When I hear such comments, I impulsively think about other plans in Korea to radically increase the amount of affordable Internet bandwidth to Korean homes. The typical Korean family currently enjoys levels of broadband connectivity that are unfathomable in most other parts of the world -- 100 Mbps, more than most entire universities in Africa. Not content with having some of the world’s fastest and most affordable broadband, the Korean government announced plans to up this figure to 1 Gbps (!). What happens when each family has access to the Internet at one gigabit per second? We don’t know, is the reply one hears from some policymakers, but won’t it be interesting to find out?

To learn more:

- The eight page briefing report *The Use of Technology in Education: Lessons from South Korea* [pdf], written by Eugenio Severin and Christine Capota at the Inter-American Development Bank, provides a good quick overview and historical perspective.

- If you are looking to learn a *lot* more, check out the 144-page *E-Learning in the Republic of Korea* [pdf], written by three notable Korean researchers (one of them Dr. Dae Joon Hwang, is a former president of KERIS) and published earlier this year by UNESCO-IITE.

- KERIS archives the country’s annual whitepapers on *Adapting Education to the Information Age*.

- The full *PISA 2009 Results: Students On Line: Digital Technologies and Performance (Volume VI)* is available for free download from the OECD.
Note: The image used at the top of this blog post of Korean students celebrating a School Sports Day ("seeking protection from all that cheap bandwidth!") comes from Wikipedian 'Spaicecowboi' via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
27. School computer labs: A bad idea?

by Michael Trucano

Originally published on Friday, 2 December 2011

As part of my job, I visit *lots* of schools around the world to see how they are actually using various types of educational technologies. Usually, and inevitably, such trips feature a visit to the school computer lab, which is, more often than not, the locus for technology use in a school. Generally speaking, I find that a school computer lab looks very much the same, no matter whether I am outside Pretoria or Phnom Penh. In most places I visit, putting all (or most) of a school's computers into a special 'computer lab' is seen as the obvious thing to do when a school is being 'computerized'. This may seem obvious ... but is it really a good idea?

A side note: School computers labs don't all look exactly the same, of course. Generally speaking, there are three general configurations I see:

lined up in rows, like in a typing or sewing class
(this is not always a coincidence, given that I have been many schools where the computer lab was converted from a room previously used for ... typing or sewing)

configured in a U-shape around the edge of the room
(given that electrical plugs are usually along the wall, this is quite practical -- and this configuration also makes it much easier for a teacher to quickly see what is on the screens of all students, ensuring that they are not on Facebook or engaged in other sorts of mischief)

grouped in small 'pods' or clusters on round or hexagonal tables spaced about the room
(an arrangement often meant to foster more 'collaboration with teams')
Now, there are lots of understandable reasons to choose to build and equip school computer labs, especially when we are talking about the situation for many schools in developing countries. They include:

- security (locked room, bars on windows);
- the fact that computers are often introduced in tandem with a new curriculum promoting the development of 'ICT literacy' skills, for which a dedicated room, and dedicated teacher, is required;
- climate control (air conditioning, sealing windows and doors against dust);
- special electrical needs (sometimes including a dedicated generator);
- the bureaucratic reality that, when funds are made available for schools to computerize, often times additional funds are made available for physical infrastructure, providing school administrators with an opportunity to add on to the size of the school;
- potential for dual use of facilities (e.g. a computer lab used by students during the day, and by the community when school is not in session);

These are just a few reasons, each of which typically makes a great deal of practical sense. It is perhaps no coincidence that, when donor funds (including those of the World Bank) are used to pay for the large scale purchases of computers for schools, the school computer lab model is seen as the 'obvious' rational choice.

Not everyone sees this model such as a good idea, however.

Indeed, the trend in industrialized countries has largely been away from computer lab-centric models for educational technologies. One reason for this is quite practical -- the computer labs are already full of computers, and if you want to buy more of them, you need to put them in other places. *Fair enough.* There is also a recognition, however, that if you want computers and other ICTs to contribute directly to impacting the learning process in core subjects, you need to put them where core subjects are being taught -- like in the classroom. The move toward 1-to-1 computing, where each student (and/or teacher) has her own dedicated laptop, can be seen in some ways as a further extension of this belief.

One mantra that many educational technology advocates repeat with increasing volume and frequency these days is that *mobile changes everything.* In many ways, I find it hard to argue with this assertion, even if, at a practical level, its influence is largely seen only in technology purchasing decisions in OECD
countries. This is not to say that 'mobile' considerations have not been important in technology choices in some developing countries. As part of the Jordan Education Initiative, teachers were provided with their own laptops. The model for the One Laptop Per Child project in many ways stands in direct opposition to the computer lab model, and Latin American countries like Uruguay and Argentina are moving aggressively towards mobile, largely laptop-centric, models. (For what it's worth, I have been surprised at the number of school computer labs that I have seen recently that feature lots of new ... laptops ... lined up in neat rows ... much like the typewriters in the images accompanying this blog post. Rather an interesting technology choice, that.) Laptops on dedicated carts, often times with integrated power outlets and safety locks -- these are sometimes referred to as COWs, or computers on wheels -- are in widespread use in some countries (and surprisingly unknown in many others). The momentum behind the use of tablets in schools, until recently a rather fringe activity mostly found in pilot projects, is growing by leaps and bounds, and we should perhaps not be surprised to see tablets in widespread use in many education systems in a few years. And yet, in most countries where the World Bank and other international donors are active in 2011, the trend continues to be to plan for building and equipping dedicated school computer labs.

Opposition to the school computer lab model has been around for quite awhile in many places. Back in 1990, for example, Gavriel Salomon wrote about The Computer Lab: A Bad Idea Now Sanctified. In the two decades since Professor Salomon's article first appeared (and he wasn't the first to come to this conclusion), the school computer lab model, which first gained prominence in the United States and other industrialized countries (and which in some ways is a natural follow-on from the university computer lab model that sprung up in the 1960s and 1970s), has essentially been imported without much discussion by most developing countries. Of course, even if this 'model' no longer works (if it ever did) for many schools in industrialized countries today, this doesn't necessarily mean that it doesn't, or
won't, work in schools in developing countries, where circumstances and learning contexts may be different (quite different, in many regards).

All of this is not to say that school computer labs are a bad idea. Or, for that matter, that they are a good idea. Rather, it is to argue that, where the decision is made to invest in them, it should be for the right reasons -- and not just because "that's what everyone else seems to be doing (or did in the past), so we should do it too".

> What does this mean for a country about ready to deploy massive numbers of computers across its schools for the first time? Does it make sense to buy fewer computers, and put them at the point of learning (i.e. in the classroom), and not into separate computer labs, segregated from where instruction in 'core subjects' takes place?

If the primary goal for introducing computers into schools is to train as many students as quickly as possible in basic office applications, school computer labs may well be the appropriate model to consider. If the goal of introducing computers into schools is to impact teaching and learning in a fundamental (and positive) way in core subjects, there may be other models to explore that can get this done more successfully. (In practice, there are almost always multiple, and often conflicting, goals, which makes things much more complicated than the simple either/or choice I am presenting here.)

The evidence base in support of the computer lab-centric school technology deployment model is, to my knowledge, not very robust. Expert opinion, at least in many OECD countries, is increasingly calling into question the reliance on school computer labs as the primary model for impactful use of educational technologies. Recent (Microsoft-sponsored) research from ITL, for example, finds that 'innovative teaching that leverages ICT happens more where students have access in their classrooms'. While conceptually this makes a lot of sense to a lot of people, there is still not a lot of rigorously obtained hard data that we can point to in support of abandoning school computer labs. Like so many things related to educational technology, people may passionately believe something, even if they can't yet 'prove' it.

That said, many education systems don't make a conscious decision -- based on either evidence or the opinion of 'experts' -- to chose the computer school lab model over other options. In fact, they often don't know that there are other practical options available to them. If you choose not to decide, you still have made a choice, a wise man once said. But that doesn't always mean you get the result you want.
Note: The images used in this blog post ("OK, everyone all together now ..." and "please prepare to change to 12 point Times New Roman, on my signal ...") come from the Franklin D. Roosevelt Presidential Library and Museum via Wikimedia Commons; they are in the public domain.
On 5 October 2011, the Indian Ministry for Human Resource Development announced the launch of a new low cost educational tablet: the Aakash. Developed by the London-based company DataWind with the Indian Institute of Technology Rajasthan, the Aakash has been described by some as potentially heralding a new 'Internet revolution' within India education, doing for educational computing what the mobile phone has done for personal communications over the past decade. The launch of this product has been accompanied by a great deal of press attention, some laudatory, some less so. Following on a visit by Indian HRD Minister Sibal in October, DataWind CEO Suneet Singh Tuli stopped by the World Bank yesterday to talk about the Aakash, and more broadly, about sustainable business models to drive the broad adoption of computing and Internet devices in the developing world.

Some critics have noted that this is not the first time such a device has been promised for India, recalling the general hoopla that greeted earlier devices like the Simputer and the $100 laptop (OLPC) project. What is different this time around, they ask, and why is the government subsidizing the purchase price of this particular gadget?

Many of the 140 or so people who gathered to hear Tuli speak about this high profile initiative, as well as the 280 or so who joined via webcast, were no doubt intrigued by the device itself. What does it look like? What can, and can't, it do -- and what does it really cost? If you are looking for answers to these sorts of questions, I recommend you have a look at the archived video from Tuli’s engaging presentation, as well as his well-considered answers to the avalanche of questions he received during the open Q&A period. You may also be interested in a YouTube video of the Aakash being reviewed on an Indian tech program. (If you check
quickly enough, you just might be able to follow the yesterday's commentary on Twitter using the #OpenDTA hashtag before it disappears into the ether.)

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I know that many World Bank staff were interested in exploring answers to larger questions as well, as part of our process of trying to 'separate the hope from the hype' as we seek to better understand how might, can and should international development agencies support initiatives of this type. What might the mass availability of sophisticated, inexpensive computing mean for the delivery of public accountability and services in different sectors? What role (if any) should government play in promoting -- and possibly subsidizing, as is the case with the Aakash -- innovative products and approaches in this area?

It is not within my competence -- nor indeed is it my place -- to try to propose answers to these sorts of big questions here. That said, I was asked by the event organizers to provide some quick comments after Tuli's speech, as a bridge to the Q&A period, and I thought I'd share them here, in case they might be of any interest.

1. Demand is high
I was not at all surprised to hear of the great number of inquiries that DataWind has received about its product since it was announced, nor to see the very large projections that the firm is making related to perceived demand for the product in the near term. As a way to keep tabs on and better understand this area, we tracked developments and press items about 50+ low cost computing devices for education for a number of years at infoDev (here are the original and updated device lists). Much of what is being reported in the press now about the Aakash recalls pronouncements, denouncements and excitement about other ICT initiatives that have explicitly targeted users in developing countries over the past decade (here's an old news archive of such articles that we used to maintain at infoDev before the sheer volume became too much to track). People have long been waiting for a computing device to break through at scale for use by the masses in developing countries, and the demand for *something* is almost palpable.

2. Phones work
The one ICT device that has undeniably broken through so far is the mobile phone (a frequent topic of discussion on this blog), although in the case of the phone, it wasn't one single product that broke through, but rather a whole class or type of product. Compared to the mobile phone, this hasn't (really) happened yet for the PC, the laptop, or numerous other purpose-built ICT devices aimed at users in developing countries, especially in the education sector. Why not?
For reasons of price, low end phones predominate in most developing country markets, but, while they don't approach the functionality of smart phones, what they do do, they for the most part do quite well, and help solve some very real and immediate needs. Calling, answering, speaking, texting: All of these functions work quite well, and are easy to understand and use, even among many folks with low levels of literacy. In addition to high quality of usability, phones benefit from lots of content. Most of this is what we would today call 'user-generated content' -- by speaking and texting, users themselves supply timely and relevant content to other users of these devices. Despite the undeniable promise, we are still waiting for a low cost 'killer app' for education in developing countries like what we have seen demonstrated in mobile phone markets.

3. Tablets are coming
After the mobile phone, might the tablet be the 'next generation' device many people have been waiting for? (The line between what constitutes a 'phone' and what constitutes a 'tablet' is quite blurry in many cases, of course, and the line will most likely continue to get blurrier still.) Tablets have been around for many years, but until the emergence of the iPad, they remained a niche device in many ways. Starting from virtually nothing two years ago, there are reportedly over 200 iPad pilots occurring in this academic year in U.S. schools alone, and one gets the sense that this is a drop in the bucket compared to what the next years may hold. And it is not just high end devices like the iPad aimed at wealthy countries that appear to be making in-roads -- here at the World Bank, I regularly get pitched on projects seeking to take advantage of the increasing availability of low cost Android tablets from companies out of China that I have never heard of in low income countries. Many other countries, from Russia to Thailand, are embarking on large scale educational tablet programs as well.

4. There are some misplaced assumptions about costs ... and quality
One mistake that many government planners seem to make when considering purchases of 'low cost' devices is that initial costs of end user devices are typically only a fraction of the total costs of most initiatives that seek to utilize such devices. One mistake I have noticed in many 'low-cost computing for the developing world' initiatives that we track is that, when they are indeed low cost (and costs often do seem to rise after initial announcements that are quite rosy), low cost often equates to low quality. Technical specs aside (one would of course expect the specs for cheaper devices to be inferior to those of higher priced equivalents), low cost has all-too-often meant a low quality user experience. For many devices that we have seen demo'ed, and piloted, in the past few years, there seems to be an implicit assumption that 'poor people' will put up with substandard user experience simply because they are poor and/or don't know any better and/or have no other
options. I am no marketing expert, but I suspect this may be an assumption worth reconsidering.

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Those are four general comments about many past 'low cost ICT device' initiatives. *What about the Aakash?* While I don't wish to comment on one specific device (again, it's not my place to do so), I note that Tuli spoke about many developments and approaches that I found quite encouraging. Here are four themes that I heard from Tuli's talk that stood out for me:

(1) **It's not about the device, its about a larger 'sustainable ecosystem'**
Tuli talked about the need for a 'sustainable ecosystem', that a low-cost device is just one piece of a larger puzzle, and that catalyzing other actors and partners (and competitors) is key to sustainable growth over time. He sees having incentives for business to participate in this ecosystem is an important way to ensure sustainability. Indeed, over time, the track record for technology initiatives that operate only as charitable efforts is not great, especially those with ambitions of going 'to scale'. That said, *building and sustaining an education ecosystem that can take full advantage of the use of new technologies is another matter.*

(2) **We need to iterate quickly, on mobile -- not PC -- time**
Tuli stressed the importance of learning from mistakes (a [popular topic](#) here on the EduTech blog, of course!) -- and being able to iterate quickly and improve constantly, regularly bringing out new devices to respond to and address user needs as they become more apparent, taking advantage of various technical improvements and cost savings that happen in the interim. Users have long grown accustomed to manufacturers bringing out new versions of their phones every six to eight months, while new models of computers have traditionally appeared every 16-24 months.

(3) **Local production and assembly are important**
Just because something happens in the education sector doesn't mean that it happens solely for educational reasons. For better or for worse, it is not uncommon for governments to support educational technology projects because they see that they will help with the development of a key local industry. In addition to the educational objectives, which should be preeminent, large scale ICT/education projects can help meet other developmental objectives as well.

(4) **While innovating on the price of the device is important, innovating on the price of connectivity may be just as important**
Back in the 1990s, tech industry pioneer John Gage famously proclaimed that 'the network is the computer'. As devices become more and more inter-connected, this
is becoming more and more true. That said, as more and more content, services and tools move 'into the cloud', Internet connectivity in most developing country contexts, and especially for the education sector, remains very expensive. Beyond the headline-grabbing price of the Aakash device (which is government-subsidized and which is a topic of much heated debated on other blogs, so I won't go into it here), DataWind's focus on driving down the cost of connectivity through compressing data on their servers before sending it on to users is to me the most intriguing or innovative aspect of its proposed business plan. Much recent press attention has been paid to services that speed up download times in markets like the United States (the onLive videogaming service and the Silk browser on the Amazon Kindle Fire are two notable examples), but this theme has received less attention in developing country markets, where both absolute and relative costs for Internet connectivity are often much higher than they in wealthier, industrialized countries. In an increasingly connected world, low cost devices are not really low cost if they require the use of expensive bandwidth to be function as intended.

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As with earlier World Bank events focusing on high profile 'low cost' computing device initiatives, I found yesterday's discussion around the Aakash to be fascinating, and it will be interesting to see how the project evolves over time. For me, there are still very real questions about the role of government in such initiatives. To what extent should governments be active catalysts for action and change in these areas? Is this something for which they are well suited, or should it be left to the market? To what extent should we worry that government actions in support of specific devices (often in pursuit of loftier goals, like 'increased access') can distort markets that have proven themselves to be very innovative and dynamic over the past decade?

All over the world, I too often see government-sponsored and subsidized school computer labs sitting idle and unused. At the same time, I see teachers walking the halls of those schools using mobile phones that were not subsidized at all. (I note parenthetically that, while I know of scores of places where school computerization efforts have been heavily subsidized by government, I know of only one country in the world that has chosen to subsidize mobile phones at scale for its citizens). This is not to say that subsidies here are inappropriate, just that, where they occur, they should be undertaken with great care, keeping in mind both the related opportunity costs and potential unintended consequences. New, exciting devices are announced nearly every week (I read about this one on stage as I was waiting for the Aakash event to begin), and, where government is involved in technology decisions, there is always a danger of driving by looking in the rear view mirror.
... and of course none of this gets to the core challenge for initiatives like the Aakash: Figuring out how these sorts of devices can be successfully used to meet core educational objectives, whatever their cost.

Note: The image used at the top of this blog post ("the tablet: resistance is futile") comes via Wikimedia Commons and is in the public domain.
Earlier this year, over 1700 participants from over 90 countries attended eLearning Africa (previous blog post here) to share lessons and make contacts at what has evolved into perhaps the continent's premier annual knowledge sharing event related to the use of ICTs in education. Not surprisingly, Tanzania led the way in terms of attendance by its nationals, followed by its East African neighbors, with South Africa and Nigeria not too far behind.

One nationality was largely noticeable through its absence: the Chinese. Why do I mention this? Outside the conference, signs of growing cooperation between Tanzania and China (and India, whose Prime Minister was in Dar the same week on a state visit) were hard to miss, and indeed, the increasing 'presence' of China across Africa is undeniable, and the topic of much reporting, scholarly interest and discussion, including at the World Bank. Looking around the conference itself, this cooperation wasn't immediately in evidence related to international cooperation around the use of educational technologies. Participating in and listening to many conversations at the event, however, one got a bit of a different story related to potential cooperation going forward between China and a number of African countries on ICT/education issues.

While comparatively few representatives from Chinese firms and organizations participated at eLA, after engaging in a few dozen informal discussions with many MOE staff, vendors and consultants, it is clear that Chinese support for the purchase of ICT infrastructure for schools will most likely increase greatly in the coming years. Scattered existing examples of small cooperation were cited by many people as a harbinger of things to come. Almost every ministry of education official with whom I spoke mentioned that they had contact of some sort with Chinese officials or partners around the use of computers in schools, and expected
this to increase in the near term (many remarked on how this contrasted with their dialogue, or lack thereof, with most 'traditional' donors on this topic).

**Why is this potentially important?** The potential for 'South-South' knowledge exchange, something [increasingly championed at the World Bank](https://www.worldbank.org/en-topic/southsouthernfinance), is pretty clear. At a [speech last year in China](https://www.worldbank.org/en/news/speech/2018/05/22/ssx-speech-2018) talking about China's achievements with Special Economic Zones and infrastructure development, the World Bank president noted that "African countries want to learn from such success, and China is ready to help." He continued: "China’s experience can be instructive for African countries. It also suffered from infrastructure deficits at the beginning of its development process but succeeded in putting in place world-class infrastructure -- covering both urban and rural areas. Africa may also draw from China’s attention to rural infrastructure as a way to improving productivity and overcoming poverty."

Discussions about 'Africa' often founder, given the (obviously) tremendous diversity in situations and circumstances across the continent. The same can be said for discussions about 'China', given its large size and great diversity. While the [results from Shanghai in the latest PISA round](https://www.pisa.oecd.org/) are the envy of much of the rest of the world, the relevance of mass school computerization efforts in rural Western China may well offer insights to some African policymakers that they might not get when talking with consultants drawing on the experience of ICT use in schools in, say, Toronto or Lyon or Manchester.

Despite what appears to be growing interest in cooperation between a number of African countries and Chinese partners on issues related to putting ICT infrastructure in schools, my anecdotal impression is that lessons from Chinese experiences in using technology in education are not well known outside of China. When I mention to ministries of education around the world that I spent a few years working on an ICT/education project in China near the start of the last decade, I am almost immediately bombarded with lots of questions.

One can postulate a number of reasons for this lack of knowledge about Chinese experiences with educational technologies, including the fact that things in China are simply happening so quickly, and as a result people have been too busy 'doing' to take the time to reflect and study this experience at great length. Of course, the same could be true of most other areas of development in China, but in some ways the educational technology field seems a bit anomalous in this regard, given the intense interest of academics and policymakers in learning from Chinese experience in so many other areas. Language is also no doubt an issue here, as recent Chinese experience with educational technologies is not well documented in English and
other major international languages (and if anything, seems to me to have become comparatively less so in recent years).

Through outreach activities of groups like KERIS, and in part due to a variety of cooperation efforts between the Republic of Korea and the World Bank exploring a variety of ICT/education issues, the Korean experience is slowly becoming better known to policymakers throughout East Asia, and further afield in places like Colombia, Costa Rica and Uruguay as well.

Here's hoping that the Chinese experience will become better known as well.

*Note*: The (provocative?) image used at the top of this blog post of two young girls ("sisters in development?") comes from Wikipedian Harald Kreutzer via Wikimedia Commons and is used according to the terms of its Creative Commons Attribution-Share Alike 3.0 Unported license.
30. eTransform Africa

by Michael Trucano
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The World Bank Group and the African Development Bank, with the support of the African Union, are producing a new 'flagship' report on how ICTs, especially mobile phones, have the potential to change fundamental business models in key sectors for Africa. The overall goal of this effort, which is known as eTransform Africa, is to raise awareness and stimulate action, especially among African governments and development practitioners, of how ICTs can contribute to the improvement and transformation of traditional and new economic and social activities in a number of sectors, including: agriculture; climate change adaptation; education; financial services; health; local ICT; public services; trade and regional integration; and 'cross-cutting' issues.

The final draft of the eTransform Africa education sector study (Transformation-Ready: The strategic application of information and communication technologies in Africa. Education Sector Study), which was prepared by a team of notable consultants at ICT Development Associates, is now available online. This 144-page report identifies specific opportunities and challenges, and recommends areas of intervention for governments, educational institutions, the private sector, NGOs, and development partners, with a particular focus on five general themes:

- Teacher professional development
- Digital learning resources
- Affordable technologies
- Education Management Information Systems (EMIS)
- National Research and Education Networks (NRENs)
The report identifies six areas where specific opportunities for action currently exist:

1. policy
2. access
3. NRENs
4. management and administration
5. digital learning resources
6. building human capacity

while at the same time noting (some) of the critical related challenges across the continent, including:

1. absence of comprehensive policies
2. lack of financing and prioritisation of ICT investments
3. limited infrastructure
4. lack of capacity at all levels to integrate and support the use of ICT in education effectively
5. many teachers do not have the necessary ICT skills
6. lack of appropriate content
7. lack of accurate, comprehensive, up-to-date data on education
8. equity

The report’s conclusion includes a set of five recommendations for policymakers:

1. Ensure that all investments in ICT in education (including those made by governments, development partners, and individual educational institutions) are – to the greatest extent possible – directed by a single, integrated ICT in education strategy so that they are working towards common national strategic objectives.

2. Adopt a suitable global professional development framework to guide national implementation of ICT professional development.
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4. Consider judicious investments in content creation and aggregation to ensure compliance with African curricula, or local language demands, motivating usage by educators and students.

5. Promote data-driven decision-making at all levels.

There is much more to this report than just these lists, of course. The authors, who have extensive and varied experience working across Africa on ICT/education projects, have offered up much food for thought, and have referenced scores of interesting initiatives and programmes across the continent that may be new to many readers of this blog. Importantly, they note that, "in all instances, planning of new interventions aimed at harnessing ICT to improve education must begin with contextualised needs analysis and careful planning that takes account of the realities within which implementation will take place." Such a statement might seem obvious -- so obvious, in fact, that it should almost go without saying -- but experiences with numerous projects across the continent over the past decade, some of which are referenced in the report, do suggest that more than a few folks need to be reminded of this very practical suggestion minimal requirement.

The full final draft of the eTransform Africa education report, and its various constituent parts (e.g. landscape analysis, case studies, etc.) available online as pdf documents on the eTransform Africa web site. Those of you pressed for time may wish to go directly to the 19-page executive summary [pdf].

In case it might be of any additional interest:

Some previous analytical work sponsored by the infoDev program and/or the World Bank's Africa region on ICT/education issues in Africa includes:

- [Survey of ICT and Education in Africa (Volume I): A Summary Report, Based on 53 Country Surveys](2007)
- [Designing Open and Distance Learning for Teacher Education in Sub-Saharan Africa: A Toolkit for Educators and Planners](2005) [pdf]
- [Enhancing Learning Opportunities in Africa - Distance Education and Information and Communication Technologies for Learning](2002)
(And of course, the EduTech blog includes regular posts about ICT/education topics in Africa as well.)

Note: The satellite image of the African continent used at the top of this blog post comes from NASA via Wikimedia Commons and is in the public domain.
About the author

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Mike Trucano is the World Bank's Senior ICT and Education Policy Specialist, serving as the World Bank's focal point on the topic within the education sector and leads the World Bank's related analytical work on under its flagship System Assessment & Benchmarking Education For Results initiative as it relates to information and communication technologies (SABER-ICT). In addition, Mike provides advice and support to World Bank country-level education projects seeking to utilize ICTs in various ways in multiple countries around the world; current areas of activity include ICT/education policy development, the use of mobile phones in education, ICT and education indicators, 'new economy skills for Africa', development of national ICT/education agencies, child Internet safety, and low-cost 'ICT devices'. A frequent public speaker on the use of ICTs in education around the world, and on ICT use for development purposes more broadly, he is also the principal contributor to the World Bank's widely read EduTech blog (http://blogs.worldbank.org/edutech) and co-chairs the World Bank's internal cross-sectoral thematic group on ICT and education.

Mike previously served as the ICT and Education Specialist at infoDev, the multi-donor 'ICT knowledge shop' housed within the World Bank's Global ICT Department (GICT), where he coordinated activities related to information and communication technologies and the Millennium Development Goals ("ICTs for MDGs"), especially as they related to education. He also led infoDev's work exploring the use of various low-cost ICT devices to meet developmental objectives in the social sectors, an initiative he continues to help lead from within the World Bank education sector, and managed the program's mobile banking work. Highlights during his time at infoDev include Knowledge Maps: ICT and Education (what we know, and what we don't, about ICT use in education in developing countries), over 75 country-level surveys of ICT and education in Africa and the Caribbean, a handbook on Monitoring and Evaluation of ICT in Education Projects, and the ICT in Education Toolkit for Policymakers, Planners & Practitioners (with UNESCO, used in over 25 countries to date).

Mike brings experience working in a variety of capacities with on-the-ground ICT/education and ICT4D initiatives in several regions of the world, including feasibility studies, evaluation and assessment, teacher training and professional development, appropriate technologies and targeted policy advice, especially related to uses of ICTs in education and community telecentres. He joined the World Bank Group in 1997, first with the IFC, and then serving on the Education and ICT for education teams at the World Bank Institute, where he was a core member of the team that developed the World Links for Development Program.

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Exploring issues related to the use of information and communication technologies to benefit education in developing countries

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