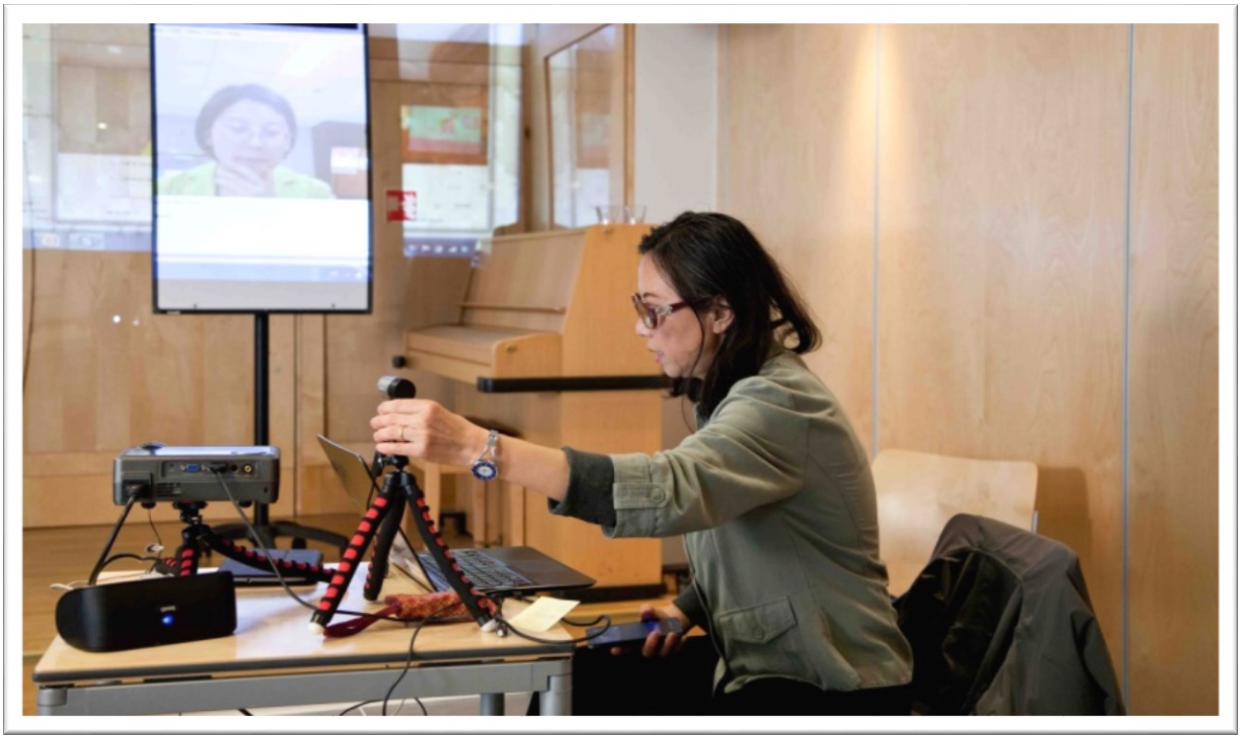
How may ICT in basic education help reach global development goals?

Report on seminar at the Norwegian Agency for Development Cooperation (Norad)

Oslo, Norway, 9 May 2014



Jingru Høivik, Chief Engineer at the National Library of Norway, preparing to use Skype at a seminar with external specialists and Norad advisors. (Photo: Laila S. Berg).

Background

Until now, authorities have increased school enrolment mainly by expanding services to reach many, but not all. In addition, many children receive education of poor quality. Globally 250 million children can neither read nor write when they start fourth grade. This may be partially explained by the large increase in children starting school not being matched by raised number of teachers, classrooms and educational material. There is a major shortage of teachers, and especially of qualified ones.

The seminar addresses ICT in teacher education and how technology may boost learning in basic education.

Services must expand and adapt to those who are the hardest to reach. Ten percent of the world's children lack schooling. About half of these children live in countries in conflict. A tweet on 8 May 2014 by @ks7s Kriti Sharma of Human Rights Watch quoted Hans Brattskar, State Secretary at the Norwegian Ministry of Foreign Affairs: Of the 56 million

children out of primary school worldwide, one third are children with disabilities. In Nepal, an 85 percent of children outside school have a disability, according to the Global Campaign for Education's website. Internally in countries, exclusion from education affects most those who are poor, part of a minority or who live in remote areas. UNICEF has documented that it is by including the most vulnerable and marginalized children one can increase the progress toward the Millennium Development Goals. Targeted and adapted use of ICT in education can help to include more.

Welcome by Vigdis Aaslund Cristofoli (moderator) Head a-i. of the Education Section, Department of Global Health, Education and Research, Norad. (Photo: Laila S. Berg).

Vigdis Aaslund Cristofoli, Chief a.i. of Norad's Education Section, welcomed participants. She said Norway is publishing a White Paper on Education for Development in June this year. It focuses on access to and quality of education in low- and middle-income countries. Technology in education is being addressed in both policies and operations, and is becoming a priority. We hold the seminar in this context, aiming to learn from experts and to build professional networks around ICT in education, Ms. Cristofoli said.

The speakers

Helge Høivik spoke about e-learning, digital documentalism and the digital classroom. Songuan Hou outlined the internet development strategy of the Open University of China. Marijana Kelentric spoke about integration of ICT into initial education of primary school teachers. Rosalind Gater presented the UK Department for International Development's (DFID) effort to study the impact of technology on teacher effectiveness and learning achievement. Ancil Torres explained how ICT for people with disabilities, including the blind and visually impaired, may be introduced in schools, libraries and work places.

Professor Helge Høivik at Oslo and Akershus University College of Applied Sciences spoke about learning and teaching in a digital world, with a library and documentalist approach. (Photo: Laila S. Berg).

Helge Høivik is Professor in e-learning and digital documentalism at the Learning Centre of Oslo and Akershus University College of Applied Sciences, where he heads the Research & Development Unit LATINA/Lab. He holds a bachelor's degree in social sciences and a master's degree in library science. In 1992-93 he was a Fulbright Visiting Scholar at the School of Education, Penn State University. Since 2010 he is Professor II at the Department of Educational Technology, Capital Normal University in Beijing, China. From 2013 he is member of a committee for digital learning under China's Ministry of Education, and Professor II at the Open University of China. Helge has held digitally oriented courses in the U.S., Africa, East Asia, the Middle East and Eastern Europe.

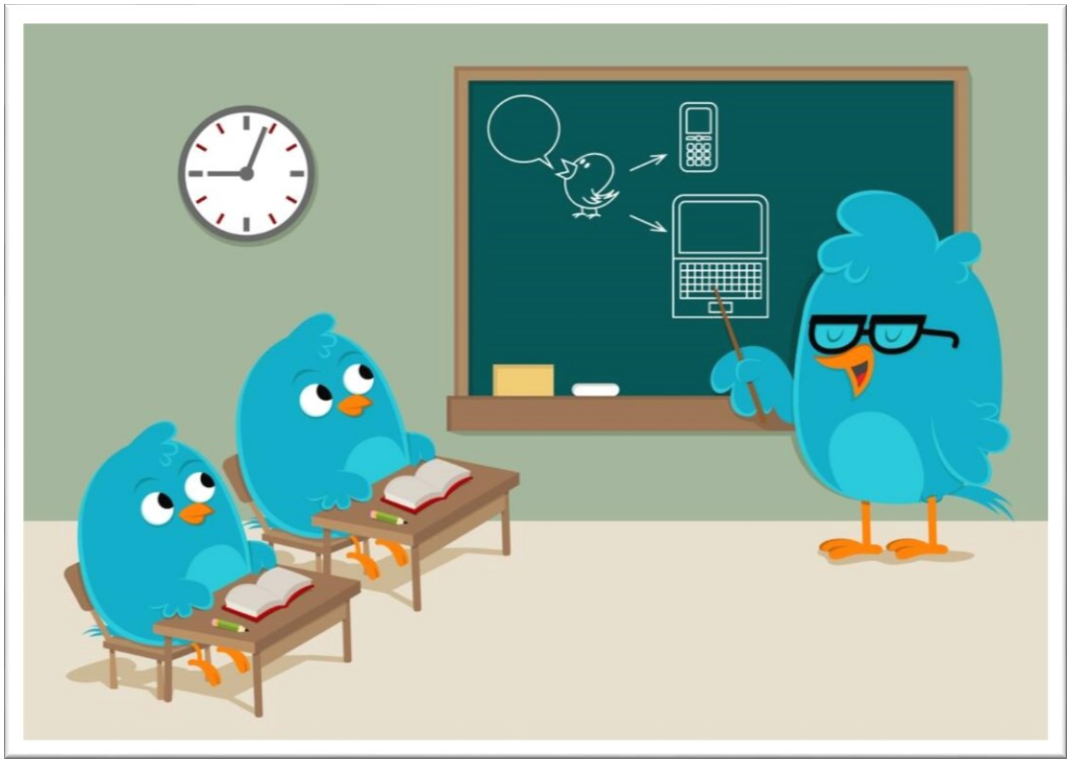
Prof. Høivik referred to methods used in summer schools in Oslo since 2007. Students from Uganda, the Palestine and China have participated, and there have been satellite events in these and other countries. In these courses, we have observed three stages since we started, he said.

- First comes the blogging stage. The students make their own blogs creating a collective publishing environment.
- In 2010 we started working with e-books and electronic magazines with more emphasis on working and publishing in groups rather than as individuals.
- Since 2012 we have turned our attention to "flipped classrooms" and a combination of online and residential courses. We develop courseware according

to the designs of Massive Open Online Courses (MOOCs), but not necessarily for a very large number of students.

The courses contain elements including open blogs, ebooks, ezines (digital magazines), online lectures containing text, still images, audio podcasts and video recordings.

Course websites that have been in operation this spring have had 3-4,000 unique visitors and 50,000 page visits. We built a digital classroom where students practice their presentations in front of the camera. These rooms combine lecturing, seminars and the functions of production studios.



We have moved toward a "training-of-trainers" model for the summer school so that a few students from our partner institutions in Africa, Asia, East Europe and elsewhere attend the residential course in Oslo. Then they act as assistant teachers when we participate in similar local events. The online materials and courseware serve both these purposes. There is a growing interest in e-learning in Africa now as exemplified by the E-Learn Africa event in late May 2014. Such initiatives have received valuable support from the World Bank.

Prof. Høivik said that as soon as we present knowledge in some medium, such as a book or a diagram, that process reshapes it and the way it is learned. Educators face the challenge of deciding how to present the content and shape the learning process in a digital medium.

Gréta Björk Guðmundsdóttir, Researcher at the Norwegian Centre for ICT in Education. (Photo: Laila S. Berg).

There are four key tendencies that impact this field just now:

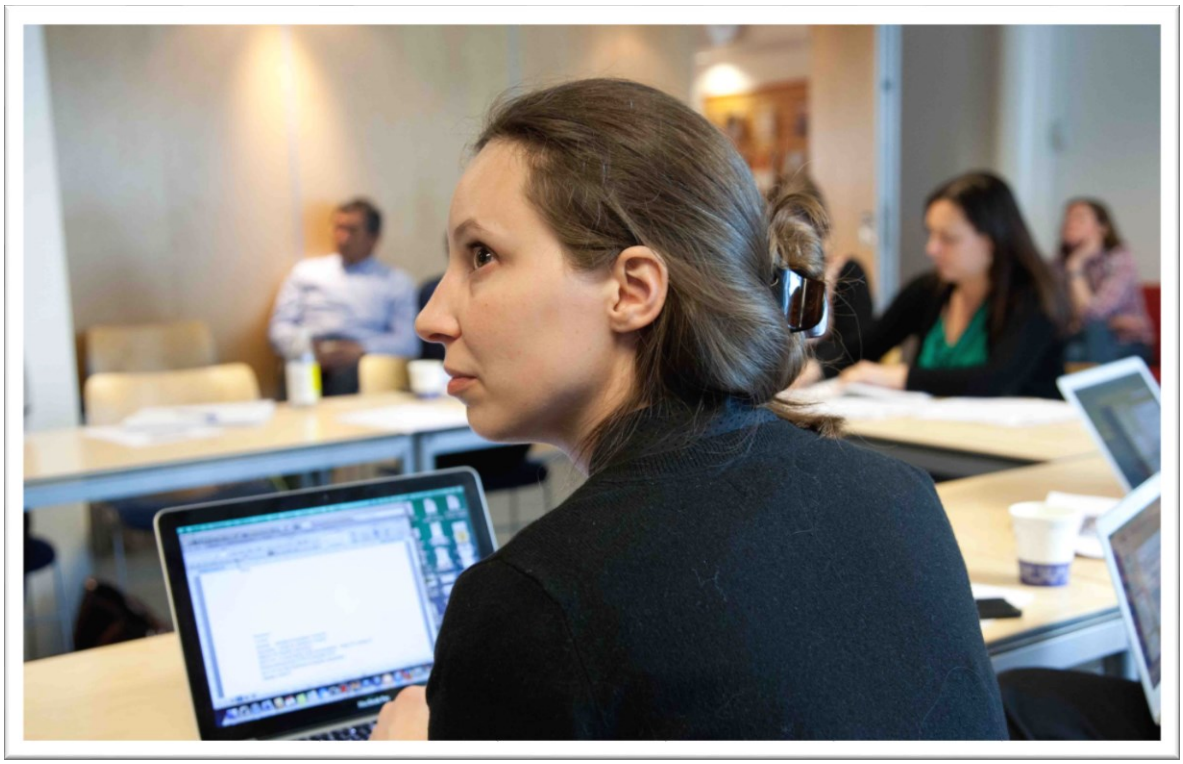
- Massification as exemplified by YouTube and Facebook.
- Disaggregation as exemplified by Google's use of individual newspaper stories to the detriment of newspaper publishing
- Boundary blurring, as exemplified by new relationships between education and work.
- Affordability, as exemplified by smartphones that will be available for USD 50 or less.

- We need to focus at design in three areas, said Høivik. They are:

- How to recruit and retain students.
- How to design the interaction process, make it interesting for students and secure good learning outcomes.
- How to design and produce the content, the texts, pictures and the videos and how they blend and support each other.

When we deal with these technologies, we need to take into consideration the lower bandwidth and stability of signal and electricity connections. In our workshops in Uganda we brought our own servers that emulated the Internet when we lost the real connection.

- In Palestine we made use of portable sets containing micro projectors and pads or radio receivers that connect to television sets, said Høivik



Marijana Kelentric is Advisor at the Norwegian Centre for ICT in Education. Her master's thesis is about the integration of ICT into teacher education in Croatia. (Photo: Laila S. Berg)

Marijana Kelentric is Advisor at the Norwegian Centre for ICT in Education in Oslo. She has completed her education as computer science teacher and English language and literature teacher in Croatia. Before moving to Norway she worked at Croatia's Ministry for Family, Veterans and Solidarity between Generations. At the University of Oslo she studied comparative and international education. Her master thesis is written within the framework of the educational theory of change and focuses on the factors that influence integration of ICT into teacher education. Marijana is currently developing tests in order to map digital competencies of pupils and teacher students in Norway.

- Croatian teachers face big challenges on a daily basis, as they have many roles and tasks. Beside preparing lessons and teaching, they need to write reports, organize parent meetings, school trips and plays, advise pupils, and more. Using ICT at the top of everything else becomes a great challenge for some teachers, she said.

This is also visible from the UNESCO's report from 2005 on ICT in the Croatian educational system where:

- 100 percent of the schools had computer classrooms with internet access
- 45 percent of the schools had their own websites
- 26 percent of teachers did not use computers
- 41 percent of the teachers did not use Internet

Similar reports on a wider scale also show that 51 percent of European teachers never require pupils to use computers when fulfilling tasks (EACEA, 2011).
A closer look at research studies about ICT in education shows a knowledge gap. Studies

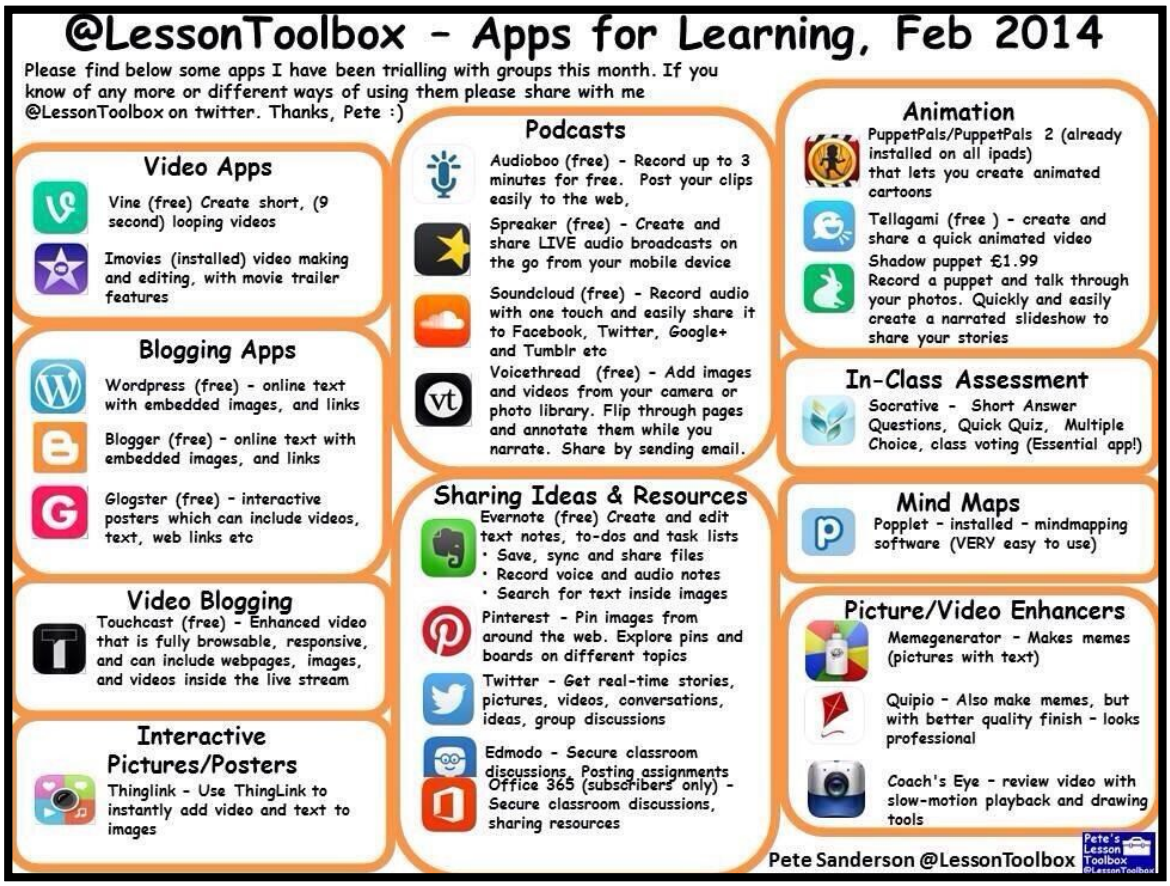
mainly deal with methodological transformations in teaching and learning, i.e. how ICT affects the costs, quality of or access to education. But when it comes to teachers, there is a lack of multilayered research about absence of a wider distribution on ICT in the educational systems.

- We need to ask teachers what prevents them from using ICT at work, said Ms. Kelentric.

She conducted qualitative research with a comparative perspective on the phases of ICT integration into initial teacher education in two regions in Croatia. The research was based on interviews with three groups of teachers involved in pre-service teacher education: university teachers, mentor teachers in practice schools and student teachers.

- I focused on mentor teachers', student teachers' and university teachers' personal experiences instead of giving them questionnaires with predefined set of answers, said Ms. Kelentric.

The study showed a significant difference in the organization of the two teacher studies that influenced other aspects of ICT integration.



A British teacher, Pete Sanderson, shared info on Twitter about apps he uses in teaching.

At the **Faculty of Teachers Education, the University of Rijeka** there are only five courses where students learn about ICT and how to teach with ICT. These are some of the responses of the teachers and students:

- What is the purpose of a computer in the classroom? To play games? They play enough games at home. To type on it? I don't know…I don't like it, said a ***mentor teacher***.
- It never occurred to me to use ICT during practice because mentor teachers don't use it, said a ***student teacher*****.**
- There is no such initiative in the sense of integration of computers. All the faculties and departments here are autonomous. I teach computer science courses and I can't even name five other courses taught at my faculty, which is ridiculous. We are all supposed to work together, said a ***university teacher*****.**

On the other hand, at the **Faculty of Teacher Education, University of J.J. Strossmayer in Osijek** students have access to 15 courses on how to teach about ICT and with ICT. They said:

- Kids nowadays are not satisfied with pen and paper only. I use a lot of different didactic tools, but ICT is their reality. They are growing up with it. We cannot ignore that. We have to adjust educational system to them because ICT offers extraordinary possibilities, said a ***mentor teacher*****.**

- Children find ICT very interesting. And it's easier for me. I mean, it can take more time to prepare a lesson but it pays off. ICT raises the quality of teaching and learning. I will continue to use ICT, said a ***student teacher.***

- We included mentor teachers from primary schools into our program at the faculty. They need to have access to professional development and cooperate with students. As scientists and researchers we need to encourage methodology teachers to transfer their knowledge to the teachers that work in schools, said a ***university teacher.***

The study on ITE program in Rijeka and Osijek found many external factors that influence the integration of ICT. They include lack of hardware and software, lack of financing, lack of technical support or lack of access to continuous professional development. These obstacles are reflected in the negative attitude of individual teachers towards ICT in education at the ITE program in Rijeka. On the other hand, teachers in Osijek invest a lot of individual and collective effort in order to overcome these external obstacles and develop positive attitude towards ICT. Their positive stance is directly transferred to their students who see the advantages around ICT in education. This is not the case in Rijeka. The study proves that young teachers play a significant role as agents of change, and that pre-service education on how to use ICT in the classroom, is important.

- I have focused on those who are newly qualified because they are most motivated to use ICT in the classroom, said Ms. Kelentric.

Assistant Professor Songuan Hou speaks via Skype about using ICT in education. In the meeting room at Norad are Gry Tinde, Senior Advisor at Norad (on left) and Jingru Høivik, Chief Engineer at the National Library of Norway. (Photo: Laila S. Berg).

Songuan Hou is Assistant Professor at the Open University of China (OUC). She has a Master of Education from the University of Manchester, UK and has worked as a Program Officer at the International Department of the Chinese Ministry of Education from 2001 to 2004. Then she worked in Beijing for the Open University in the UK, responsible for network building with Chinese institutions. She coordinates the development of online mini course at the OUC. At Norad, she talked via Skype about the internet development strategy of the University, in the past, present and future.

- The Open University of China was established under the name of China Central Radio and TV University in 1979. The Institution currently has 2.7 million students and operates directly online and via 44 provincial open universities, 279 prefecture - schools and 625 centers at district and county level, she said.

OUC history
1979 - A Radio & TV University
1982 - TV Programs
1995 - CERNET
1999 - Web-based Learning
2012 - Cloud-based learning
2013 - Open University of China

OUC's mission is:

- Openness, obligation, quality, diversity, and internationalization.
- To provide education access to remote areas, to fulfil education equity.

There are 26 programs at the undergraduate level, 69 programs on a diploma level and a variety of training programs.

Infrastructure in the past

- Online delivery and distance learning through 1-2 level channels.
  There were problems with the 2-3 level transferring system.
    - Students needed to learn on different platforms
    - Every branch and college needed to build a data centre
    - Expensive equipment and labour costs
    - The data process was stored in different, isolated data centres

Over time, information islands were forming. Meanwhile, there was a lot of waste of resources.

Infrastructure presently

Management and operation support system;

- Cloud-based information structure
    - Cloud Classroom

  Information security system

Integration and optimalization of IT resources, present

- Unified data centre
- Unified data storage
- Automatic resource allocation
- Provide learning service for third-party corporate university

Features of IT infrastructure include integration, standards, flexibility and efficiency. Infrastructure in the near future are Cloud-based resources with terminals all connected to iPad, PC or with programs connected as a library (Photoshop, Flash etc.)

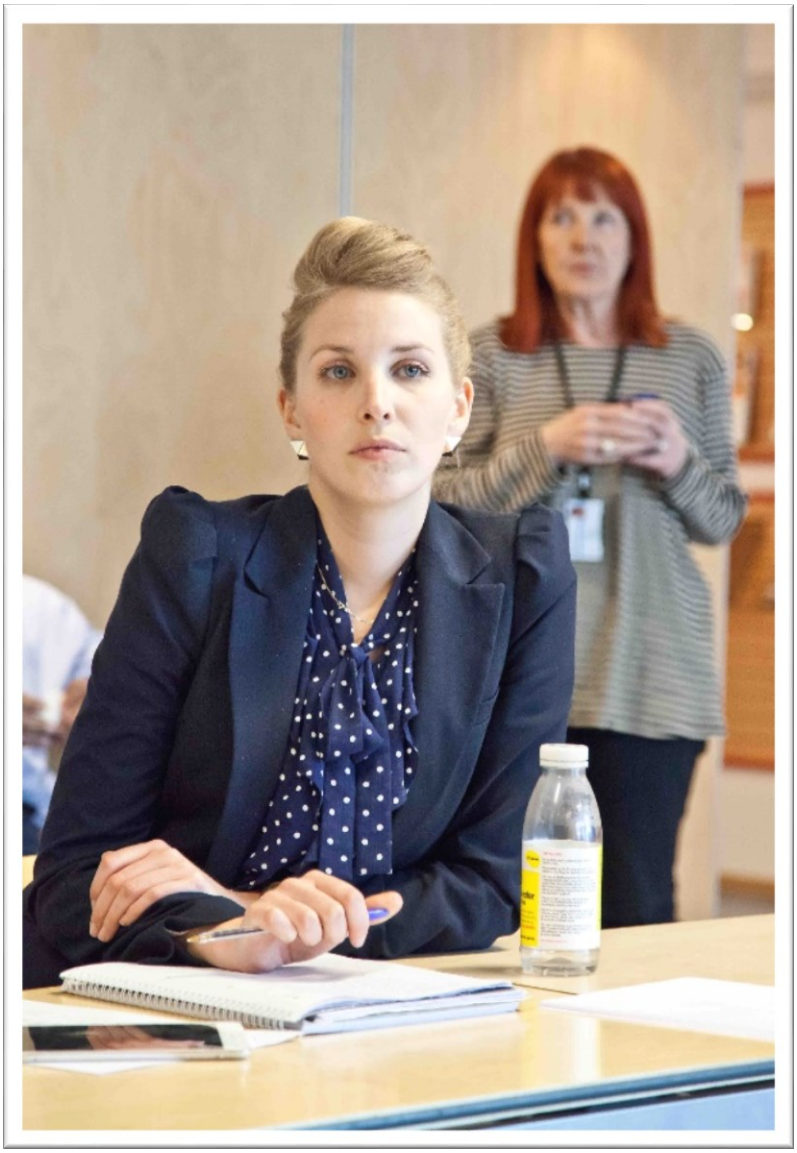
OUC supporting education

In the past the TV programs were the most common way for electronic training of teachers. Now primary and secondary school teachers are trained through online and distance learning. Subjects aim to improve professional abilities and training principles and their management and leadership skills.

The training ranges from Chinese language, math, science, history, geology, psychology, to the arts, painting, music and physical education. The OUC has contributed using ICT infrastructure and has trained teachers in the central and western areas of China.
OUC activities:

- Education support to ethnic minorities
- Works with the Chinese Disabled Federation, implementing training for students with disabilities
- ”One village, one graduate” program, with 16 different programs, such as ”Home of vegetables”
- For the armed forces, the soldiers are learning online from their camps
- Chinese language for foreigners

- School of Art and Law exploring ways of teaching Chinese traditional culture in rural areas
- Education for communities and training for rural areas



Rosalind Gater, Education Advisor at DFID, has synthesized material on the impact of technology on teacher effectiveness and student learning. (Photo: Laila S. Berg)

Rosalind Gater has worked with ICT in education in the Department for International Development (DFID) since 2013. Ms. Gater has a degree in English from Cambridge University in the UK and a master`s degree in International Education Policy from Harvard University. Between 2006-2013 she worked as an English teacher in the UK, Rwanda, Swaziland and South Africa . She has also worked in the NGO sector, for Network for Africa in Rwanda and Equal Education in South Africa. Ms. Gater has collected evidence on the impact of technology on teacher effectiveness and student learning in low and lower-middle income countries. A Topic Guide will be published in June 2014, which

synthezises findings from over 80 studies from sub-Saharan Africa, Asia and South America. Ms. Gater blogged on DFID's site about her visit at Norad.

The Topic Guide is being published at a critical time for children around the world who are affected by a learning crisis. The quality of teaching and learning still lags behind access to education. The last 10 years have witnessed an explosion in educational technology, the impact of which is hotly debated but yet poorly evidenced. The paper synthesises evidence to provide timely and relevant support to decision makers in government, NGOs, the private sector, donors and schools to challenge and improve the way we use educational technology.

Ms. Gater said simply providing access to technology does not improve learning, even when access is 1:1 and guaranteed. When addressing the needs and rights of marginalised children, it is unlikely to help the learning outcome to introduce ITC unless the activity is specifically adapted to the disadvantaged group in question. In addition, at present, teachers struggle to find resources on the Internet that are relevant to their context.

Further, Ms. Gater said that from her experience educational technology programmes are more likely to work if teachers are given ongoing and regular support in their use of ITC in the classroom, and this is true even if the teachers are trained and capable. Another point is that integrating technology often increases teachers' workload, and this increase in teachers' time, is often overlooked.

- Finally, technology can improve efficiencies in data collection, and communication between ministries of education, teachers and students, said Ms. Gater.

Geir Ottestad, Senior Adviser at the Norwegian Centre for ICT in Education, and Norad advisors listening to Ancil Torres, who spoke via phone from USA about how the National Library in Trinidad and Tobago provided assistive technology to users with disabilities. (Photo: Laila S. Berg)

- As a little boy in Trinidad, I was told at the library that they had only printed books. This is in stark contrast to the selection of assistive technology that children with disabilities may use at school and in libraries today, said Mr. Torres. (Photo: Inter-American Development Bank)

Ancil Torres from Trinidad and Tobago is President of the W.R. Torres Foundation for the Blind, which has offices in Washington, D.C., and Trinidad. The Torres Foundation specializes in distribution and training in the use of assistive technology for people who are blind or visually impaired. The first conference in the Caribbean and Latin America about assistive technology was held by the Foundation in 2005.

Ancil has been blind since birth. His wife Sonia Aslam from Pakistan is also blind, and teaches assistive technology at the Foundation. Via their international network Ancil and Sonia advocate for better access and accommodation for blind people in schools, universities, libraries and work places.

Ancil Torres said he was born in Santa Cruz on the island of Trinidad in the Caribbean. In 1997 his father, who was blind, died. Mr. Torres was in the United States at the time, where he had started his education, thanks to support from his father. Ancil Torres set up the WR Torres Foundation for the Blind that year in memory of his father. Mr. Torres, like his father, was born blind/partially sighted. Growing up in Trinidad he had limited materials at school and was not well accommodated as a blind student. Teachers tried their best with what they had. He used a mechanical braille reader and a "Cuban rythm board" for arithmetics. Staff at the local library told him there were only printed books and no help available for visually impaired children. Because of the opportunity to learn about assistive technology in the U.S. he wanted to take this knowledge to Trinidad. He

was on contract with the U.S. Social Security Administration to help accommodate persons with disabilities in the workplace. Some 6,000 persons with disabilities needed accommodation on a new local area network system, following a lawsuit.

Using the model he and his team had developed at the Social Security Administration in the U.S., Mr. Torres worked to integrate assistive technology in as many educational, government and business systems as possible in Trinidad and Tobago. First, he approached the National Library, which was very receptive. A pilot program offered computer literacy, using specialized technology. He followed up by proposing a range of assistive technology for people who are blind, with low vision or hearing impaired. "I threw in everything in that proposal, almost including the kitchen sink", Mr. Torres said. The library accepted the entire proposal, and he was pleased because this was what needed to be done. The National Library contracted the Torres Foundation for the Blind to install, implement and train on this new system at the library. Today in Trinidad and Tobago there are substantial numbers of technology solutions available for people who are blind, across the island. Tobago is a fairly autonomous region and is not fully on board yet, but there are proposals out there to make it happen.

The initiative was a tremendous success, in that you have many more persons with disabilities, especially people who are blind, entering universities. We have someone who used to work for the Foundation going for her PhD now. Other blind persons are pursuing different kinds of degrees because these technologies are much more available than before. The public library is now fully accessible. We took these solutions to other Caribbean islands, including Barbados and Jamaica. Right now, we are intensely working on three projects in Jamaica, with the support of the politician Floyd Morris. In 2006 when the UN Convention on the Rights of Persons with Disabilities (CRPD) came about, the first country to sign the Convention was Jamaica. This was much thanks to Floyd Morris, the first blind member and President of the Senate of Jamaica, which is his current position.

Problems are not 100 percent solved; there is still a lot of room for improvement. The National Library of Trinidad and Tobago adopted its assistive technology solutions in 2003 and took it further in 2009 by setting up a music studio. It is fully adapted with specialized assistive technology that people who are blind use to produce music. There are many talented musicians in Trinidad and Tobago who are blind. The first CD is out and the quality is impressive. Tunes are being played on jazz radio stations on the web, and the effort is a source of great pride for everyone involved.

In Washington, D.C. the Torres Foundation works with various federal agencies, the Department of Defense (DOD) being the primary customer. A project within DOD provides assistive technology training and support to other federal agencies in the U.S.

A few years ago, the Foundation did a survey, asking people who are blind and visually impaired in Trinidad and Tobago what is the biggest barrier to their development in society. Surprisingly, 27 percent (the largest response group) said that awareness was their main concern. Not education, employment or assistive technology. The respondents wished people would understand what a disability is about, and saw awareness about the capabilities of persons with disabilities as a big challenge. Initially Mr. Torres was puzzled about this finding. However, when you think about it, he said, if you had more awareness

in society about what people who are disabled can do, there would be a lot more openness to education and employment. For example, if I am non-disabled person meeting people with disabilities looking for a job, what is my frame of reference if I am not informed about disability issues? I would think, what can you do as a disabled person, going back to whatever frame of reference you have about people with disabilities. Many times, it is not positive. In Trinidad, for instance, your only interaction with a person with disabilities could have been with a blind man begging in the street. Your reaction to hiring a person with disabilities could be quite negative. But if the employer were educated and aware that, for instance, a blind person can surf the internet, send and receive e-mails and produce music with technological savvy, it would open doors and change attitudes.

Since 2009, the Torres Foundation has been promoting positive development of the blind via "Camp Can Do" for youth between 14 and 21. Hosted on the island of Tobago, the camp brings in blind specialists in the sciences, horseback riding and more, to show what blind people can actually do. Even those who are blind do not always know all the possibilities, such as a blind scientist being able to conduct chemical experiments in a lab. By meeting such a scientist, they learned to their surprise that this can be done. Human resources representatives who participated also broadened their minds on what blind employees are able to do. When I was a boy, people often talked to me about things I could not do, not so much about things I could do, Mr. Torres said.

Q & A

Q: Rosalind Gater, Education Advisor at DFID, asked about barriers to integration of assistive technologies in low- and middle-income countries, realizing that cost is a major obstacle in for instance Sub-Saharan Africa. She asked Mr. Torres to give examples of where assistive technologies are being used.

A: Mr. Torres said the cost of assistive technologies is a big problem for people living in poor countries, including in the Caribbean. One way to give broad access and overcome major costs of technology investments is for instance via an initiative such as the National Library of Trinidad and Tobago. By funding the equipment there, the library gives access for members of the public who have disabilities to expensive, assistive technology such as Braillewriters and screen-reading technology. A few years ago the Ministry of Education of Trinidad and Tobago a few years ago installed assistive technology systems in public schools and several of their special schools. The Foundation is a dealer for one of the largest assistive technology producers in the US, giving a 69 percent discount on the Jaws screen-reading software that enables blind people to operate computers.

We also work with GW Micro, a competing software to Jaws, which is free once you own Microsoft Office. Trinidad offers a 3,000 USD grant for assistive technology for students attending university.

Q: Grant Dansie, Education Advisor at Norad, asked if there is assistive technology that is more relevant and cost effective for children to use in rural areas, where modern technology and electricity may be lacking?

A: Mr. Torres: There are less expensive solutions; the question is how effective they are. People in these areas need to connect with foundations such as the WR Torres Foundation

that may make these technologies available for free or at low cost. We work with technology industries and are aware of equipment that is no longer being used and may be donated, for instance. People supporting the education of children with disabilities need to be resourceful and go out there and ask. It is amazing how much may actually become available once you ask.

As the two speakers who had joined from overseas disconnected, Ms. Cristofoli invited participants around the table to share their views. Learning from experts will equip Norad to provide better advice and respond to the challenge of integrating ICT in education programmes, she said. Priorities are to improve learning outcomes in basic education and enhance teacher training. Some key questions: What expectations should we have from ICT in education? What are the success factors, and what are the research gaps? How does one achieve cost effectiveness in introducing ICT in education?

Points made during the discussion:

- ICT should be seen as a means to an end, not an end in itself.
- Equity is at stake in the area of ICT in education, illustrated by differences in available resources between urban and rural areas
- Are we talking about learning outcomes in terms of being able to pass an exam, or is it about processes such as being able to analyse issues?
- Engaging youth is wise, as they are great at solving issues. For instance by holding a "hackathon" with young people one has been able to solve difficult problems that older people were not able to figure out.
- Is education an end or a means to an end? The educational system is changing. How is the educational system beneficial for a number of ends? For instance in South Africa there are high tensions between an academic elite wanting universities to become an advanced research institution vs. the need to take care of students who need to find work after finishing a bachelor's degree. In Palestine, for instance, teachers have little access to technology that the students are used to having at home. How may Norwegian aid help support a radical change of educational systems?
- It is important to define the goals one wants to achieve with ICT. Technology does not guarantee success if it is not used in the right way.
- Education of teachers is key. UNESCO provides tools on educating teachers in ICT first, and then training them in how to use ICT to teach.
- Videos via smartphones may be projected on a wall for teaching purposes. Apps make this possible.
- Research in Namibia and South Africa showed that they are keen to put ICT into schools, while training the teachers tends to be forgotten.
- In Zimbabwe a UN staff member introduced TSS (training, support, supervision) in this area.
- Insight is crucial when ordering ICT activities. Research can clarify the issue theoretically and practically. Partners in low- and middle-income countries need to be allowed to formulate what will be needed in their school district. A small pre-study could help prevent failures. Ask: How could technology support you? Some would say not at all, while others would come up with suggestions.

- Too many children go through school without learning enough, and this is the starting point for our effort.
- In a crisis situation in a poor country, where there are not enough teachers and children are not learning, technology may not play a role until costs come down.
- How can we use ICT efficiently to manage to train future teachers? Before 2015 low- and middle-income countries need 5.2 million teachers, and many who are teachers today have poor qualifications.
- Using technology in the place of teachers who are not there, could be a temporary solution, an emergency procedure.
- We do not know enough about how to use ITC to train teachers faster.
- The new textual environment is integral to education. Some say books are cheap to produce and the use of textbooks should continue. But a study in Beijing released in May 2014 found that 60 percent now read on their phones, 40 percent in books. What will a school be like without textbooks?
- How is technology used now in education in rural, poor areas? There are many examples out there.
- We have not solved the quality issue in education. In a large number of countries where Norad works, the curriculum has not been updated in many years. Learning materials are lacking. This does not prepare young people very well for the society they will live and work in.
- In refugee camps in Sub-Saharan Africa ICT in teaching is being used, by linking via the web to teachers in South Africa, for instance.
- In the UK schools only account for 30 percent of students' achievements. Peer effects, home environment etc. count in.
- Today it is easy to make e-books. An entrepreneurial woman in Uganda that one of the participants spoke to just launched an e-book business because it is easy.
- Computer literacy has been a school subject in high-income countries for decades, and this is important to keep in mind when supporting school curricula in low- and middle-income countries. At the University of Zimbabwe, learning how to use a computer is part of introductory training, due to lack of equipment and ICT learning in basic and secondary education.
- There is an expressed wish in low- and middle-income countries to develop the contents themselves of their education, such as in Massive Open Online Courses (MOOCs) and this must be done electronically.
- This is not a question of should we use ICT in education or not, but rather, when and how is it useful?
- ICT provides a learning opportunity for children with disabilities.
- There is a need for research on learning outcomes of ICT in education in environments that lack resources or are fragile.
- Initiatives that are locally based and south-south cooperation are crucial for success.

Written by Laila S. Berg and Gry Tina Tinde