ICT Integration in Education

Discussion Summary

This e-Discussion was conducted by The Commonwealth Education Hub as a precursor to the ICT integration in Education Roundtable at 19 CCEM, Bahamas June 2015.
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Introduction

Leading up to the 19 Conference of Commonwealth Education Ministers (CCEM) to be held on 22-26 June 2015 in the Bahamas, The Commonwealth Secretariat organised an e-discussion on “ICT integration in Education” through its newly launched knowledge service - The Commonwealth Education Hub. The objective of the two week e-discussion was to engage a wide range of stakeholders from various professional and geographical backgrounds and to solicit their expertise and opinions on the issues and challenges in integrating ICT tools - technological devices, Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) - into a country’s overall education system.

Prof. Asha Kanwar, President and CEO of Commonwealth of Learning initiated the discussion. Guest Moderated by a leading education professional, the discussion reached out to about 750 participants, comprising representatives from Education Ministries, development organisations, the private sector and academia from across the 53 countries of the Commonwealth. Responses were received from eight countries spanning all six Commonwealth regions (Africa, The Americas, Asia, Caribbean, Europe and Pacific). Key areas of focus which emerged from the discussions included: broadband provision, educator training, higher-education business models, and ICT policy integration.

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About The Education Hub

Conceived as a ‘network of networks,’ The Commonwealth Education Hub is intended to promote knowledge sharing and collaboration among policy-makers and practitioners across the Commonwealth. Through its virtual ‘one-stop-shop,’ the Hub offers an array of online knowledge services designed to enable easier access to relevant information and resources, as well as to strengthen the collaborative context within which approaches, solutions, and best practices can be shared and adopted at scale across the Commonwealth, and perhaps even more widely.

www.thecommonwealth-educationhub.net
Discussion Summary

Key points & recommendations

The discussion highlighted that the use of Information and Communication Technologies (ICTs) will be central to learning at all levels in future and that educational models will change dramatically as a result. Policy-makers and educators alike will need to adapt to support this change, focusing in particular on - broadband provision, educator training, higher-education business models, and ICT policy integration.

Key recommendations emerging from the discussions included:

- **Increasing broadband access** for education should be a priority for Governments in developing countries to enable integration of ICT in teaching and learning.
- **ICT in education policies need to be reviewed** in light of technological advances, ensuring integration between ICT and education policies and the inclusion of relevant sections on OER and MOOCs to provide direction at national level.
- **ICT in education policies need to be backed by clear implementation plans**, with sufficient political will and funds to ensure integration.
- Instituting **monitoring and evaluation mechanisms** at national and institutional level to assess ICT in education initiatives, would help integrate lessons learnt and assist sustainability.
- Quality assurance and accreditation bodies need to articulate new frameworks to enable **recognition and credit transfer for MOOCs**.
- **Continuous professional development of teachers** and academics in ICT integration for teaching and learning should be considered central to all ICT in education initiatives.

The discussion explored these themes in greater detail, citing a number of relevant issues and examples.

Issues discussed

Access to Technology

While many governments are taking steps to provide tablets and laptops to students - for example **St Lucia** have implemented a Secondary School One Laptop Per Child initiative - the discussion identified limited broadband access as the major impediment to ICT integration in Education, particularly in developing countries. Further focus was also needed on increasing teacher access to technology and on addressing sustainability issues related to total costs of ownership (maintenance, recurring costs).

OER and MOOCs
Comments highlighted the problem of access to educational material and sourcing of relevant content for ICT integration projects at school level. They suggested that the role of Open Educational Resources (OER) in addressing this is increasingly being recognized. One example cited the use of OER in Antigua and Barbuda helping to increase learning outcomes in Mathematics by 20%. Another referenced an intervention in Samoa providing access to OERs via school-based ICT centres. Similarly, MOOCs were seen as a means of helping local teachers to update their knowledge and develop new teaching materials. Both MOOCs and OER were thought to have the potential to not only help reduce costs, but also to increase the quality of educational transactions.

While MOOCs are increasingly being seen as a means of enabling access to higher education for large numbers, issues remain around recognition and credit transfer. Discussion noted that at present there are few examples of MOOCs being awarded formal degree credits, although several efforts are underway. Despite the progress of ICT and growth of open, distance and eLearning, higher education institutions, in particular, are still working to find the right “business models”.

**Focus on teachers**

A number of comments drew the focus back to the teacher, suggesting the need for ICT interventions to focus on developing teachers’ (and academics’) ICT capacities in order to enable a more creative engagement with ICT content and tools. Given rapid technological advances, continuous capacity building need of teachers and principals was identified as a major challenge. Using blended learning designs to help teachers model their teaching on the basis of their learning was recommended (as exemplified by the work of an Indian institution). Similarly, the discussion referenced “nano-learning” - enabling teachers to use ICT tools to design personalized learning experiences delivered via mobile and handheld devices. The Commonwealth Certificate for Teacher ICT Integration was also cited as a useful teacher training resource example.

**Mainstreaming ICT integration**

It was also pointed out that ICT integration in education has remained at the experimental stage, and not yet been mainstreamed. This is in part due to the continuous emergence of new technologies, but the more systemic problem was thought to be a lack of monitoring and evaluation of interventions at country level, preventing critical assessment of impact and leveraging of lessons learnt.

**ICT in Education Policies**

Whilst it was noted that ICT initiatives have often preceded policy development, there were clear calls for a focus on reviewing and updating ICT policies. In several countries existing policies are outdated and need revision to include and legitimise new developments such as eLearning, OER and MOOCs. Comments welcomed calls in the recent Qingdao Declaration for greater international cooperation on ICT initiatives and policy-making. Having the right kinds of policies in place with adequate budget and a clear implementation plan can make a significant difference, as some of the examples from the Pacific and the Caribbean demonstrated.
Commonwealth Case Studies

(From Guest Moderator Sanjaya Mishra)

Using UNESCO’s ICT Competency Framework for Teachers in Guyana

In Guyana, the ICT Professional Development Strategy for Teachers is based on the assumption that, if teacher training programmes embrace ICT, there will be improvements in learner performance. It is built on the UNESCO ICT Competence Framework for Teachers (CFT). The ICT CFT aims to inform educational policy makers, teacher/educators, providers of professional learning and working teachers of the role of ICT in educational reform, as well as to assist countries in developing national ICT competency standards for teachers with an ICT in Education Master Plan approach. Read More.

Case studies on OER based e-learning (India, Sri Lanka, Malaysia)

The widespread adoption of open educational practices has implications for the professional development of staff in the areas of curriculum renewal, adoption of and engagement with OEP, managing workloads and time in complex learning and teaching contexts, optimising efficiencies and reusability, and building collaborative partnerships with internal as well as external stakeholders. The four case studies in this collection (Open University of Sri Lanka; Indira Gandhi National Open University; National Institute of Open Schooling; Wawasan Open University) show how these educational organisations are meeting these challenges and supporting open education practices. Read More.

Integrating ICT into Teacher Education Curriculum - Case Studies in Asia

Each of the seven collated case studies involved a teacher-education course in Educational Technology, more specifically, an ICT-related course for pre-service teachers as well as for the retraining of teachers. The collection presents differences and similarities in the approaches taken in preparing student teachers in the use of ICT for teaching and learning. The cases show diverse perceptions across institutions on when and how to integrate ICT in the teacher education curriculum. Read More.

1:1 eLearning enriches Education in Malaysia

Terengganu province started the state funded ‘Projek Buku Elektronik’ to increase digital access and literacy among students and families. The projects has reduced the digital divide between urban and rural, and high and low income households. This was supported by national initiatives like the Smart Schools Initiative and collaboration with private sector Intel Corp. Read More.

3D Online Education Initiative for Experiential Learning, Australia
The 3D Online Education initiative demonstrates innovative uses of high-speed broadband and digital technologies in the delivery of learning, particularly in science, technology, engineering and mathematics (STEM) subjects, using 3D technologies. In the process, it will help to create new alliances between the Commonwealth Scientific and Industrial Research Organisation (the CSIRO), commercial partners and educational institutions to facilitate the more rapid take-up of broadband enabled 3D learning initiatives across Australia. The goal is to bring 3D immersive learning into the classroom and home and provide an interactive learning experience, enhancing education through the use of technology. The outcomes of this project will be used as a basis for expanding the use of 3D learning techniques in education more generally. Read More.

The SMS Story, Papua New Guinea

The SMS Story pilot project was a controlled trial of the impact of using daily mobile phone text messages to send English lesson plans and stories to elementary teachers. The intervention was part of a joint collaboration of VSO with the PNG DoE and the Australian Department of Foreign Affairs and Trade to improve the reading ability of children in PNG. The aim of the SMS Story research project was to determine if daily mobile phone text message stories and lesson plans would improve children’s reading in Papua New Guinea (PNG) elementary schools. Read More.

National Mission on Education through ICTs (NME-ICT), India

“Train 10 thousand teachers” is a major initiative under the NMEICT, in which IIT Kharagpur and IIT Bombay are working as partner institutes to improve the teaching skills of engineering college teachers of the country in core Engineering and Science subjects. Under the programme, two-week ISTE workshops are held during the vacation period in summer and winter. Live lectures are given by IIT faculty. The participating teachers attend training at a remote center close to their own college, and also attend tutorial and lab sessions conducted in the same center. The lecture transmission and live interaction takes place through distance mode using the AVIEW technology and the internet, at selected remote centers across the country. Read More.

Multimedia Classroom, Bangladesh

The education initiatives by Access to Information Project aim to make teaching and learning more effective and enjoyable for both students and teachers using ICT. a2i has followed a 3-pronged approach in its efforts to remodel education: establishing Multimedia Classrooms in secondary schools, training teachers on making ICT aided educational content on hard-to-grasp topics and make electronic versions of text books available in primary and secondary levels including technical, vocational and Madrasa institutions. As part of the education reform driven by the Ministry of Education, a2i through public private partnership has so far established 500 multimedia classrooms in secondary schools and trained about 4500 teachers through 400 trainers of public training institutes. Read More.

(From Participants)

Creating Quality Textbooks using OER, Antigua and Barbuda (From Asha Kanwar)
Antigua and Barbuda, a small island state, have recently developed national OER policies. The Government embedded OER in their ICT in Education Policy. The Ministry has adopted a Creative Commons default license for all publicly funded materials. Their experience of creating textbooks using Open Education Resources (OER) in Mathematics found that learning outcomes had increased by 20%. Read More.

The SchoolNet Project, Samoa (From Ioana Chan Mow)

The SchoolNet and Community Access Project (SchoolNet) aims to improve the quality of education in Samoa by providing electronic teaching and learning materials (e-Resources) to support teacher development and improved student learning outcomes. 42 secondary schools across Samoa are participating in the project. They all received access to ICT equipment (via Learning Centres) and the e-library: a comprehensive repository of e-resources covering all grades and content areas for the following priority subjects - Science (Agricultural Science, Biology, Chemistry and Physics), Mathematics and English. Read More.

Related Resources

(From Guest Moderator, Sanjaya Mishra)

Technology Tools for Teachers
Commonwealth Educational Media Centre for Asia, New Delhi, 2014
(PDF, 2 MB)
Identifies a list of open source tools that can be used in the classroom setting and provides tips for integrating technology in teaching and learning

Transforming Education: The Power of ICT Policies
United Nations Educational, Scientific and Cultural Organization (UNESCO), France; 2011
http://www.cto.int/wp-content/themes/solid/_layout/dc/k-r/211842e.pdf
(PDF, 3 MB)
provides top level insights into the experience of specific countries and offer road maps to help policy-makers better plan the integration of technologies in education

The Technological Pedagogical Content Knowledge Framework for Teachers and Teacher Educators
Matthew K, Punya M, Mete A, Joshua M.R; Michigan State University, Department of Counseling, Educational Psychology, and Special Education, East Lansing, MI, 2013
(PDF, 1 MB)

D. Derek Wu, ITHAKA; 2015
(PDF, 400 KB)
A research review of literature in the field on online learning. This is a useful resource to read about the evidence of the impact of online learning.

**Future Ready Schools: Building Technology Infrastructure for Learning**  
U.S. Department of Education; 2014.  
Builds a case for developing infrastructure for improving broadband access in schools, especially for the US. Useful for countries focusing a comprehensive educational technology plan.

**Large-Scale, Government Supported Educational Tablet Initiatives**  
Rana M.T, Eugene B, David P and Robert M.B; Commonwealth of Learning, 2015  
A systematic review of current government-supported tablet initiatives around the world and their origins, underlying principles, financial and organisational models, and expected outcomes.

**BC Open Textbook Initiative**  
BC Campus, Vancouver, Canada  
Making higher education more accessible by reducing student cost through the use of openly licensed textbooks with a collection of open textbooks.  
(From Participants)

**Qingdao Declaration promotes use of ICT to achieve education targets in new sustainable development goals**  
(From Stacey Mascall, Jim Wynn, Asha Kanwar)  
UNESCO, 2015  
Outlines that the future of learning at every level will include ICTs, and demonstrates the need for international cooperation.

**The Open University**  
(From Brenda Gourley)  
The Open University UK  
[http://www.open.ac.uk/](http://www.open.ac.uk/)  
The Open University (UK) and other institutions have made very good material (content) available to students for use by people who are not necessarily the ones who would have put such content together.

**Horizon Reports**  
(From Brenda Gourley and Madan Pant)  
New Media Consortium, USA  
Portal with a collection of technological and higher education articles / reports which includes issues on ICT integration in education.
**Duo Lingo** *(From Madan Pant)*  
Duo Lingo, Pittsburgh, USA  
https://www.duolingo.com/  
*Duolingo is the free science-based language education platform - an example of OER*

**Khan Academy** *(From Madan Pant)*  
Khan Academy, USA  
https://www.khanacademy.org/  
*A non-profit portal that provides free online materials and resources to support personalized education for learners of all ages.*

**Transnational qualifications framework for the Virtual University for Small States of the Commonwealth** *(From Venkataraman Balaji)*  
Commonwealth of Learning, Canada; 2015  
*Developed in the context of the Small States of the Commonwealth, can provide a sound and practical beginning to launch this integration process*

**Educational Technology and Management Academy (ETMA)** *(From Marmar Mukhopadhyay)*  
Gurgaon, India  
http://etma-india.in/  
*ETMA designed a project to make teachers pioneers of innovation and of ICT integration in Education.*

**Commonwealth Certificate for Teacher ICT Integration: Preparing Teachers for ICT Integration into Teaching and Learning** *(From Asha Kanwar)*  
Commonwealth of Learning, Canada  
*CCTI is designed to improve teachers’ experience of teaching in the classroom with ICT and increase school managers’ involvement in ICT implementation in the school*

**Rift Valley Technical Training Institute** *(From Jepkemboi Kerich)*  
Rift Valley Technical Training Institute, Eldoret, Kenya  
*Successfully promotes skills sharing whereby teachers who have been trained on ICT adoption, share skills with other teachers, to integrate ICT in education.*
**Discussion Question**

From: Asha Kanwar  
Sent: 30 May 2015 01:52  
To: Education Hub Discussion Group

**Dear Excellencies, Commonwealth Partners, and Colleagues,**

The Commonwealth of Learning (COL) is very pleased to be invited by the Commonwealth Secretariat to initiate and serve as Guest Moderator for The Commonwealth Education Hub pilot project’s first online discussion. Further to the Hub Moderation Team’s [welcome note](#), this first of two discussions taking place over the next two weeks is on the theme of the 19CCEM Ministerial Roundtable on ICT integration in Education. I strongly encourage everyone to actively participate, especially those unable to attend the 19CCEM or this particular Roundtable.

**Discussion Background and Questions**

The theme of one of the four Ministerial Roundtables at the 19CCEM is ICT integration in Education. The purpose of this Roundtable is to look at innovative, real-world approaches that have successfully integrated ICTs, mobile devices and new online learning technologies, such as Massive Open Online Courses (MOOCs), into education systems, especially those which are scalable and replicable across the Commonwealth.

Three presentations are foreseen, followed by discussion, covering the three areas in ICT where major advances have been made—technological devices that support teaching and learning (tablets etc.), Open Educational Resources (OER), and MOOCs. The Roundtable will be an opportunity for Ministers to share issues and challenges faced with ICT integration into their overall education systems, particularly in relation to performance and productivity.

In advance of this Roundtable, we are using this on-line forum to initiate discussions that we hope will contribute to making the in-person meeting and the outcomes more relevant, focused and enriching. As we prepare to embrace the post-2015 development agenda, we will need to address the challenges of connectivity, content and capacity, if we are to achieve the goals identified by the global community.

The first challenge is connectivity. Mobile phones are increasingly connecting people—but there is still a digital divide in terms of broadband availability. The digital divide is now more a bandwidth divide. Even today 60% of the world’s population lacks access to the internet.
The second challenge is lack of quality content—it is true that today we see more digital content available on the web than ever before—but is this free and open? Is this available in local languages to be of use to the most remote and marginalised populations?

The third challenge is inadequate capacity. Teachers in many developing countries are being given tablets by their governments—but do they have the capacity to use them to improve both the learning experience and learning outcomes?

With these points in mind, I invite your inputs on the following questions:

- What issues and challenges are you facing, or anticipate facing, in integrating these three ICT tools—technological devices, OER and MOOCs—into your overall education systems?
- Have you had any success stories that may be of interest to share with the group?
- How can policy initiatives to integrate ICT in education—and especially new developments like OER and MOOC—help?

Please feel free to comment more than once, including on responses from other contributors. This discussion will close around 10 June 2015. My colleague Dr. Sanjaya Mishra, Education Specialist, eLearning at the Commonwealth of Learning, will facilitate the discussion as Guest Moderator, and synthesize your responses to share with the Chair, presenters and participants ahead of their meeting. A brief note on the Roundtable is attached for your reference.

I and my colleagues at COL look forward to a stimulating and rich discussion that all of us can reflect on as we prepare to meet in the Bahamas next month.

Best regards,

Professor Asha Kanwar
President and CEO, Commonwealth of Learning
Vancouver, Canada
Full Responses

Messages received with thanks from -

Sanjaya Mishra, Commonwealth of Learning, Canada
Esther Brathwaite, Ministry of Education, Government of St Lucia, St. Lucia
Jepkemboi Kerich, Rift Valley Technical Training Institute, Kenya
Joana Chan Mow, National University of Samoa, Samoa
Asha Kanwar (2), Commonwealth of Learning, Canada
Shashi Prakash Goyal, Ministry of Human Resource Development, Government of India, India
Sanjaya Mishra (2), Commonwealth of Learning, Canada
Marmar Mukhopadhyay, Educational Technology and Management Academy, India
Venkataraman Balaji, Commonwealth of Learning, Canada
Madan Pant, India
Brenda Gourley, United Kingdom
Evode Mukama, University of Rwanda, Rwanda
Jim Wynn, Imagine Education, United Kingdom
Stacey Mascall, Ministry of Education, Antigua & Barbuda

From: Stacey Mascall
Sent: 15 June 2015 10:28

Through the eyes of a Caribbean citizen:

I am also familiarizing myself with the Qingdao Declaration. Let me hasten to say that it is about time that such a global statement is made. There are too many efforts being made and large sums of money spent for us - doesn’t seem to be getting it right! What exist is basically lots of experimenting and no measuring to assess impacts of initiatives undertaken, and lack efforts of sustaining what was implemented. The reality is, we need to be clear as to whether we want to get our respective institutions/organizations/countries through the articulation of a clear and realistic vision on ICTs. Having set a vision, we then must look at ways that will allow us to effectively achieve the set goals/objectives. Having done this we must establish how we will assess achievements or failures. Having assessed, we must use the data of such assessments to be our guide - as to whether we need adjustments or simply revamp the solution because it does not fit. This must be determined early and carefully, led by data.

Here is where the new science of knowledge management becomes relevant. The effective management of knowledge guarantees that data will be obtained in completion, distributed in a timely fashion for analysis or in its analyzed state already, to assist decision making. Once this is embraced we will begin to see value for money.

For this to take place Managers cannot remain in the background failing to understand fully what their roles are in guiding the process. They ought to be leading the process. They must have the
basic knowledge as to how the use of ICTs will enable them to achieve the vision they have articulted. This will enable them to provide the necessary support and provide the associated tools in getting the job done.

For this transformation we need sound leadership, Leaders that are prepared to listen to the technocrats; leaders who are engaged in the process; leaders who appreciate the potential risks and are committed to give support. Leaders who have that element of trust, so that new solutions can be explored and obsolete ones or ones that cannot be tailored to fit are discarded.

Specifically for Government leaders (especially in the Caribbean), we must look within our countries and seek to provide the necessary capacity building that is needed for the citizens to take this charge forward. Coming from a small country, we have depended a lot on consultants from other countries. We need to develop solutions - that are home-grown to fit the local context. We need to create opportunities - so that these efforts are sustained through continuous consultations. This can only be achieved effectively if the implementer is available (long term) and is equipped with the relevant skill sets to assist in this process.

The mandate is given, let us seriously look towards the creation of real solutions that can achieve the proposed results that have been posited in the declaration.

Stacey Mascall
Ministry of Education
Antigua and Barbuda

From: Jim Wynn
Sent: 12 June 2015 12:06

I have just returned from Paris after a 3 day policy meeting at UNESCO Global High Level Policy Forum. Firstly the recent Qingdao declaration was discussed which makes it totally clear that the future of learning at every level will include ICTs, and secondly policy makers, especially in HE, are still swimming around trying to work out how business models will change especially with the growth of open, distance and e-learning. The forum also looked at the poor numbers of people able to access Higher Education and predicted a time in the not too distant future where the number of universities will shrink, world-wide, but the numbers of students will accelerate, due to the growth of on-line learning.

What didn’t get enough debate was the fact that the current number of youth NEETs world-wide, a number similar to the population of North America, is being under-served by the education system. It doesn’t provide young people with the skills economies need and Universities that do not tackle this will be amongst the ones that die. Old fashioned notions of what courses look like and what accreditation is trying to accredit HAVE to change. The future isn’t MOOCs or University campuses it is as one person said at the forum much more likely a combination of clicks and bricks, not one or the other.

Jim Wynn
Imagine Education
Bristol, United Kingdom
From: Evode Mukama  
Sent: 11 June 2015 21:17

Dear all,

One point that would be interesting to discuss during the ministers' meeting could be the ICT total cost of ownership. Sometimes, we talk about deploying ICTs in schools such as tablets, netbooks, One Laptop Per Child (OLPC), Internet etc. but we rarely talk about the costs related to these pedagogical tools once in schools such as, but not limited to, the costs of electricity and Internet, maintenance, teacher and student training, stabilizers, surge protectors, printing facilities, cabling, tables and chairs (if we refer to Computer Labs) etc. It would be appreciated if Governments could conduct a survey on ICT Total Cost of Ownership in their respective countries at least once every five years to understand the kind of ICT-related investments involved in real terms.

Maybe, other strategies could be envisioned in additional to the Governments support, such as "Bring Your Own Device" and Public Private Partnership.

Best regards,

Evode Mukama  
University of Rwanda  
Kigali, Rwanda

From: Brenda Gourley  
Sent: 10 June 2015 19:11

Dear All

Issues and challenges integrating into overall education systems  
It seems to me that we have to distinguish between those systems where broadband is readily available and the education system reasonably sophisticated.

Where broadband is not readily available (and inexpensive), it should be brought home to policy makers that broadband is an education imperative. Every day that students (and adults) have no access to the amazing resources available online is but another day that they fall ever more behind what is happening in first world countries. Technology and all it enables does not stand still waiting for anyone to catch up. MOOCs and all they make possible are almost irrelevant in countries with no broadband - or only very expensive broadband (like South Africa).

Quality Assurance and Accreditation bodies could be real agents for change if they would lead the system by being clear that not only are certain MOOCs accredited but positively encouraged. The Open University (UK) and other institutions have demonstrated that where very good material (content) is available to students, it can then be supported by people who are not necessarily the ones who would have put such content together. There are many very good teachers who are necessary to interpret the content, localise it for local conditions and provide a helping hand through the learning journey. The combination of MOOCs (textbooks, in essence but a whole lot cheaper and easier to keep up to date) and good support on the ground might well constitute better quality than local teachers who have to not only provide content but also student support. Quality Assurance agencies should be bold enough to say that. MOOCs and other online content might well gain better
acceptance if the Accreditation bodies were staffed and directed to remove as many barriers to acceptance as they can.

When a whole system has to be scaled up (as it does in many countries in the world where populations are growing beyond the capacity of the present system to accommodate) it is not just a matter of bricks and mortar, it is the staffing that is difficult to provide. OERs, especially in STEM subjects, can help to provide what will be difficult (certainly in the short to medium term) to provide locally. Local policy makers need to understand the possibilities and pointed to examples. We need to recognize that universities are not good at transferring credits even in the present system, much less in a system where MOOCs abound. Funding bodies and other policy makers need to understand this and move to reward (even enforce) credit transfer in some way. Hundreds of thousands of students across the world fall out of the system every year. They fall out for a variety of reasons, not all of them academic. If they could easily transfer the credits they have accumulated they could come back into the system when they are ready at much less cost. The present drop-out rate is not only unacceptable for the students but for the taxpayer.

We need to recognize that there is a chronic shortage of academics who are also sophisticated users of technology - much less innovative users of technology (See Horizon Reports of last few years). Policy makers and funding bodies could direct resources into courses that provide learning for the academic staff - and over time, require of universities that staff have some qualification in this arena. Most professional bodies (accountants, doctors, etc) require a certain number of hours each year for updating knowledge and skills. Why should this not apply to the academic world?

I hope these brief comments are helpful

Brenda Gourley
London, United Kingdom

From: Madan Pant
Sent: 10 June 2015 14:31

ICT integration in Education

Whether we draw analogies from tipping point, phase transitions, paradigm shift, disruptive innovation, points of inflection, singularities, metamorphosis, emergence in complex systems, or a quantum jump, we cannot help drawing the inference that because of the influence of ICT, education in the future is likely to be very different from the educational models of the past. The recent and predicted advances in machine learning and artificial intelligence (see video ‘humans need not apply’) clearly point towards developing creativity and higher order thinking abilities which are at the top levels of Bloom’s taxonomy as opposed to the base levels of remembering, understanding and applying that is the focus today, but will be done by software and robots in the future. (See also the Economist May 9th-15th 2015 issue articles on pages 11 and 18).

The big challenge of the present is how we can rapidly, at massive scale and at affordable costs, train in the desirable new skills and build new expertise. Teachers are central to this, because while an expert may demonstrate an expertise, it is the teacher who through a series of steps progresses the ignorant person into an expert. That is why the role of the teacher will be more important in the future, than it has ever been before. To develop our model, we have invoked ideas presented by Sir John Daniel in 2009 at an ICET conference keynote “How do we recruit and train 10 million teachers?”. 
I think we have to collectively re-define the role of the teacher/educator as moving forward from merely the transactor of the syllabus/curriculum prescribed by the regulators to a set of passive learners, to designing and managing the learning experience of each learner as an active self-directed learner, who will no longer be seated for hours on neat rows of desks. (Google "sitting is the new smoking"). Further a group of Scientists at Stanford have done research to support that walking enhances creativity.

The term in vogue for self-directed learning is ‘Heutagogy’. The educator of the future therefore will be a practitioner of ‘heutagogy’. And most frequently will work as an ‘independent’ professional rather than a low level employee of a public system, at the mercy of the powers that be. The disintermediation that is driven by the Internet will disruptively transform the existing model. The key technology for this mission will be access with mobile and handheld devices (and wearables soon) with mobile internet for connectivity, which is very effective for creating and sharing bite-sized content or ‘nano-learning’ objects that fosters social learning and custom made learning pathways based on learner analytics.

Educators will have to leverage existing technologies for a more effective personalised learning experience. While one view is that better efficiencies occur when the learners are told the principles/facts, which they ought to know, the other view is that technology enables learners to find information and construct their knowledge, and acquire ‘deeper learning’. The metaphor of ‘giving a fish or teaching how to fish’. So the pursuit for quality content is not the main task. Content can be priceless or content can be worthless; it depends upon how the content is transacted, and how and what knowledge is constructed.

The most important task is therefore capacity building, both for the learners as well as the organisers of the learning experience. It is often assumed that the young learners who are digital natives can respond well to the new technological age. They may be good at navigating the devices, but seeking the right resources and constructing learning requires guidance for most. And organisers of learning have greater challenges, because of their additional responsibilities.

Learning from MAAM is now about learning from Mobile Apps and MOOCs. Learning a language with Duolingo or Maths from Khan Academy and preparation for the IELTS exam from FutureLearn are examples of events that happened very recently. Organisers of learning have to respond to them and benefit by their presence.

The new pedagogies of Flipped learning, Personalised learning and Social learning are able to integrate OERs, MOOCs and Mobile Apps readily in the learning experience.

What have we done?

We are great believers that individuals and small groups of committed persons and communities can make a big difference. We are inspired by Margaret Mead and Elinor Ostrom in this approach. As a group of committed individuals and sometime with support of external agencies, we have delivered the following:

- A MOOC about OERs run on the Wiziq platform.
- A 4 week course using only e-mail and WhatsApp on "Becoming an UberSmart Autonomous Self-directed learner"
- A 4 week course on thinking using only WhatsApp with title "An Open mind". Even the registration
was by sending a WhatsApp message. So even a feature phone with built in WhatsApp is good enough. Need not be a Smartphone

What are we doing?

Addressing 4 categories:
1. Young Learners typically in grades 6 and above
2. Grown up life-long learners (aged 40+)
3. Committed, progressive, aspiring teachers who want to make a difference
4. Parents who want to take part in the educational journey with their children

For each of these categories, we are designing about 3-5 modules, each delivered over 4 weeks entirely on e-mail and with WhatsApp that can be transacted entirely with mobiles and handhelds across the 3 major platforms in a BYOD (Bring Your Own Device) mode.

Opportunities will exist for Meetups in person occasionally but will not be a mandatory requirement. Compressed and intensive versions would be available for those who want it. Participants will then become part of a mentoring-coaching program that will cater to their individual needs.

The domains of interest are:
- Learning to learn: making all learners more self-directed learners
- Learning to think: New thinking for the new millennium
- Overcoming Maths Phobia
- Coping with a VUCA (Volatile, Uncertain, Complex and Ambiguous) future

The happy conclusion is that the answers to the challenges of the new technologies including 'machine intelligence' which has got some illustrious persons like Stephen Hawking, Elon Musk and Bill Gates extremely worried lies in our responses of learning to harness the enormous powers of these emerging technologies, to make a better world, through knowledge and a higher purpose to serve humanity, rather than just a few corporates or Governments.

Madan Pant
Gurgaon, India

From: Venkataraman Balaji
Sent: 09 June 2015 21:28

Here is a contribution to this discussion. I refer specifically to the point raised in the message from Mr. Shashi Prakash Goyal of the Ministry of Human Resources Development, India.

Currently, formal, academic recognition of a MOOC as a credit-bearing course offering is more sporadic than systematic. Looking at trends overall, few (if any) of the highly-rated research universities have extended such recognition. Sir John Daniel, former President of COL and renowned thinker, has consistently raised this as a potential lacuna in the way MOOCs were being promoted as a breakthrough in Higher Education.
COL’s Transnational Qualifications Framework (PDF, 1.5 MB), developed in the context of the Small States of the Commonwealth, can provide a sound and practical beginning to launch this important and rather complex process.

A key consideration would be to ensure that the testing and assessment protocol is widely and speedily accepted. From what I know, the slow acceptance of MOOC credits in Higher Education is largely due to the reluctance of institutions to converge on global, common standards and procedures to assess learning online. Technology can certainly help.

Balaji

Venkataraman Balaji
The Commonwealth of Learning
Burnaby, Canada

From: Marmar Mukhopadhyay
Sent: 09 June 2015 20:14

Dear Colleagues,

Here are my comments/responses to the three questions.

1. What issues and challenges are you facing, or anticipate facing, in integrating these three ICT tools – technological devices, OER and MOOCs – into your overall education systems?

The biggest challenge for ICT Integration in Education, especially Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) is Internet Connectivity. Internet use per 100 people in the eight Asian Commonwealth Countries ranges from a low of 2.6 (Bangladesh) to a high of 15.1 (India), notable when these four south Asian countries (Sri Lanka and Pakistan included) account for 98% of the population of the Commonwealth Asian countries. The development of mobile phone technology and its broad reach among young people, make access to hardware less of an issue in the region.

2. Have you had any success stories that may be of interest to share with the group?

The Educational Technology and Management Academy (ETMA), a research and development organisation based in Gurgaon, India, recognizes the centrality of teachers to educational reforms. Instead of looking at teachers as bearers of the “burden of innovation”, ETMA designed a project to make teachers pioneers of innovation and of ICT integration in Education. The purpose was to challenge their creativity and to enhance self-confidence.

ETMA developed a new template for capacity building of teachers in ICT integration in Education by including development of skills in using Web 2.0 tools and social networking (e-mails, Google Groups, Face book, Blogs, and Wikis, Video Conferencing using Hangouts/Skype, etc.); accessing the internet, especially OER (textual materials, still visuals, videos); curriculum specific personalized content generation, and integration of digital content in Blended Learning Designs.

In yet another innovative initiative, ETMA developed and used multimedia to train teachers, supported by online resources like e-tutorials, online quizzes, tests, etc.
Such innovative activities in technology enhanced learning (TEL) have been successfully piloted with more than 5000 school teachers from both government and private schools.

3. How can policy initiatives to integrate ICT in education - and especially new developments like OER and MOOC - help?

a) ICT in Education initiatives began in most developing countries in the early 1980s led by a few entrepreneurial individuals and/or groups of individuals. In India, government initiatives, especially computer education initiatives, followed immediately afterwards (1984). These initiatives were sporadic and had the limited aim of developing computer skills (private sector) or the "demystification of the computer" (government). Parallel operations and initiatives were not coordinated.

b) ICT in Education Policy came much later in the early 2000’s to mid-2010’s. Policies provide direction; give legitimacy to ICT in education activities; create synergy between private and government efforts (Public-Private Partnerships); and reduce costs and enhance cost-benefit ratios.

c) Policies on ICT integration in education, online education, OER, MOOCs, etc. would provide the legitimacy needed for the administration of credit based choice systems, credit accumulation and credit transfers for qualifications that are necessary for entry into higher education courses and jobs.

d) OER and MOOCs have the potential to change the face of education and learning paradigms. There have been efforts to create repositories in different subjects. However, our own exploration indicates that neither teachers in service nor those under training are familiar with the existence of such repositories. This leaves such an important initiative grossly underutilized. The effect of OER repositories would be understood only when these are put to use. A similar statement can be made about MOOCs. These are still an urban phenomenon accessible to a small number of potential learners. As more than 70% of learners and people live in rural areas, there is a need for an advocacy programme for these two powerful innovations.

e) However, policy by itself remains a non-starter unless backed by political will from the country government. Political will (to do) is indicated by a blue print for policy implementation or an Action Plan, adequate financial provision and a sound mechanism for monitoring and evaluation. ICT policies in education must be complemented by a detailed action plan.

f) Teachers are gatekeepers of innovation in education. ICT in Education is no exception. ICT initiatives in most countries, including India, have bypassed teachers. Whilst there are many schemes to provide computers and laptops to students, including one-laptop-per-child, there is no scheme for laptops or computers for teachers. Teachers training in computer use may at best empower them cognitively, opening the door to effective empowerment. ICT Policies in Education must focus on teachers as one of the key themes.

g) Technology enabled learning has moved from conventional computer aided learning to connected online and e-learning. The critical factor is no longer access to computers. Handheld lightweight mobile phones now fulfil that role. The essential challenge of OERs, MOOCS and other forms of eLearning is Internet connectivity.
h) There are 9.5 PCs per 100 people in India, but 77.58 mobile users per 100 Indians. Only 15.1 people per 100 Indians have internet connectivity; more than PCs/100 but much less than mobiles/100 Indians. Subject to the availability of Internet connectivity, the mobile users (77.58%) could access OER repositories and online courses. I cite the case of India; but this is equally true for other developing countries, especially in Asian and African Commonwealth countries.

The substantive point is the need to increase Internet connectivity. Individual country governments must consider the issue of Internet connectivity for exploiting the benefits of ICT in education. ICT Policy in education must include policies on the Internet. USA, UK, Canada and Australia extensively debated the issue of the power of the internet for learning in the closing years of the 1990’s.

The issue of the Internet’s role in learning should find a major place in the deliberations of the 19CCEM Ministers’ Round Table.

Warm regards,

Marmar Mukhopadhyay
Educational Technology and Management Academy
Gurgaon, India

From: Sanjaya Mishra
Sent: 09 June 2015 15:53

Dear Excellencies, Commonwealth Partners, and Colleagues,

Thanks to all of you who have shared their views / questions / comments on the discussion. In order to recap and provide links to different sources, and request others to enrich the discussion, I am sharing some of my thoughts here.

**ICT integration in Education**

Some of you have identified the challenge of teacher ICT integration at all levels, and considering that digital natives (those who use mobiles, computers and Internet) are now coming to schools and colleges, it is important that teachers are prepared to use ICTs effectively. The Commonwealth of Learning (COL) developed a programme for teacher ICT integration based on the UNESCO ICT-CFT Framework in 2011. The revised version of the course material is available for adoption/adaptation.

**Mobile Devices in Education**

The development of mobile technology and its access is growing every day. For example, Ioana Chan Mow from National University of Samoa indicated that mobile penetration in Samoa is 93%, and Esther Brathwaite from Ministry of Education, Saint Lucia informed us of the success story of laptop distribution in all secondary schools in 2013. While the results reported from Saint Lucia are very encouraging, a review of published information about large scale tablet implementation revealed that use of tablets followed the euphoria surrounding them rather than any educational frameworks. COL are currently working on a review to better understand the teaching and learning effectiveness of mobile devices.
Recognition of online courses

The issue of recognizing online courses and giving credits to MOOCs is complex and challenging as different models and systems are followed in different countries and institutions. While universities offering online courses as part of formal face-to-face-education and completely online programmes are not new, MOOCs are relatively new. In the case of online education, the body that provides recognition/accreditation to face-to-face courses/programmes mostly does so for online education as well. For example in Canada, most online programmes are recognized by virtue of being offered by a higher learning institution that is recognized by the provincial governments. However, the accreditation of colleges offering online programmes comes from the Canadian Education and Training Accreditation Commission (CETA). Specific programmes such as computer science programmes receive accreditation from the Computer Science Accreditation Council (CSAC).

As for MOOCs receiving credits which are transferable from university to university, we are in early days. Not many examples are available. The Georgia State University (GSU) in 2013 announced that “MOOCs taken at other institutions are governed by the rules for transfer credit and credit by examination. If a MOOC was taken and transcripted at an accredited institution of higher education, decisions about credit for the MOOC are made according to the rules for transfer credit”. There are also several other universities having courses accredited by American Council on Education (ACE). However, not many examples are available at present on giving credits for taking MOOCs. In India, a committee (I served as an invited member of the Committee) appointed by the University Grants Commission (UGC) in 2013 looked into “MOOCs in Indian Higher Education”, and recommended giving credit to courses completed through MOOCs, and suggested that initially universities may give credits up to 15% of total credits completed by a student. However, I am not aware of any developments after this report.

The issue of giving credits to online courses -- MOOCs or small private online courses (SPOCs) -- might be governed by a national framework of quality assurance, with specific credit transfer remaining within the domain of the individual institutions. I hope to have responded to Sh Goyal's query from India. Thanks for asking this important question.

Policy Developments

Some references have also been made to policy related to open and distance learning and OER in the discussion so far. It may be useful to highlight the challenges of developing and implementing relevant policies. We can learn from each other on what works in developing and implementing policy. Please do share your thoughts on this with respect to MOOCs, OER, and ICT in education, in general.

We still have a few days to go, and I am sure that many of you have been thinking on the issues raised by Prof. Kanwar. Please continue to share your thoughts.

Regards,

Sanjaya Mishra
Commonwealth of Learning
Vancouver, Canada

From: Shashi Prakash Goyal
Sent: 08 June 2015 14:04
Dear Dr. Mishra,

I would like to know how online courses like MOOCs are recognized by various universities across the world. Is a course offered by say Stanford University recognized by say University of Toronto or any other university, or not? If yes, how and what are the modalities and the details?

Regards,

Shashi Prakash Goyal
Ministry of Human Resource Development, Government of India
New Delhi, India

From: Asha Kanwar
Sent: 06 June 2015 14:51

Dear Esther,

Thank you for sharing the information about the OLPC project in St Lucia.

Quality content contributes significantly to learning outcomes. I was at a recent conference on ‘ICT and post-2015 Education’ in Qingdao, where the Hon Minister from Antigua and Barbuda shared their experience of creating textbooks using Open Education Resources (OER) in Maths and found that learning outcomes had increased by 20%.

I agree that the professional development of teachers is critical to the success of the project—COL has developed resources (Commonwealth Certificate for Teacher ICT Integration) which are available on the COL website and may be useful.

Warm regards

Asha

Asha Kanwar
Commonwealth of Learning (COL)
Vancouver, Canada

From: Ioana Chan Mow
Sent: 06 June 2015 14:25

Here are some thoughts for the discussion.

What issues and challenges are you facing, or anticipate facing, in integrating these three ICT tools - technological devices, OER and MOOCs into your overall education systems?
The issues we face are very similar to all other underdeveloped countries. The SchoolNet project is perhaps the biggest ICT integration project in education in Samoa where there are now SchoolNet centres in 42 schools, all secondary level with the exception of one. The Education Ministry have tried to install the centres, to provide training on the use of the Open Education Resources (OER)
provided, and to provide technical support. Integration is at the level of tertiary and secondary but resourcing is still the biggest issue for us in Samoa.

Another critical issue is the need for more training in how to create content and also for teachers in how to use the technology. Technology adoption is not a straight forward process and so many factors impinge on acceptance and adoption of technology, not just technical but sociocultural factors as well. Maintenance and technical support continue to be an issue despite genuine efforts by the Ministry.

Mobile penetration is very high in Samoa (93%) and this needs to be leveraged for potential delivery of OERs to students. A significant infrastructure development is the recent establishment of the Samoa National Broadband highway (SNBH) which connects all government ministries, schools and hospitals. Such connectivity has the potential to facilitate online and distance learning (ODL), collaboration, communication and data sharing amongst schools.

**Have you had any success stories that may be of interest to share with the group? How can policy initiatives to integrate ICT in education - and especially new developments like OER and MOOC - help?**

Policies drive implementation and right now Samoa does not have an ODL policy. Instituting policies and plans will not only provide for planned implementation, but is also usually a requirement funding agencies look for in funding proposals and requests.

Ioana Chan Mow  
National University of Samoa  
Apia, Samoa

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**From: Jepkemboi Kerich**  
**Sent: 05 June 2015 22:27**

I believe a key challenge is the attitudes and capacities of the lecturers with regard to the use of ICT.

One success story that I have seen in our institution is skills sharing whereby teachers who have been trained on ICT adoption, share skills with other teachers, and those in turn share with others with the hope that soon all teachers will have adequate skills to enable them to integrate ICT in education.

On policy initiatives, I suggest that national and institutional policies should spell out methods and expected time bound outcomes of integrating ICT in education.

Ms. Jepkemboi Kerich  
Rift Valley Technical Training Institute  
Eldoret, Kenya

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**From: Esther Brathwaite**  
**Sent: 05 June 2015 18:59**

Dear Colleagues,
The Ministry of Education, Human Resource Development and Labour of Saint Lucia implemented the Secondary Schools One Laptop per Child Initiative (OLPC) in September 2013. ICT integration in schools is therefore fairly new for the Ministry of Education. Like many of our sister Ministries in the Commonwealth especially in Small States, similar initiatives have had their limitations, and continue to have challenges. At the same time, we at the Ministry of Education in Saint Lucia have realized several benefits and opportunities in introducing the OLPC island-wide.

The Government of Saint Lucia from September 2013 has provided a laptop for every secondary school student in rural and urban areas throughout Saint Lucia and to secondary school students from Forms 3 to 5. The students leave Form 5 upon graduation with their laptop.

Improving the quality of instruction with the infusion or integration of ICT into teaching and learning is the objective of the OLPC programme. We do recognize that integrating ICT in the classroom is more involved than just the distribution of laptops. The challenges we face include: leadership in the administration of the ICT integration in the classroom, ICT teacher professional development, consistent access to the technology, cost of technology access, ICT curriculum development, internet access, need for increased bandwidth, building ICT content and being current in the access to ICT content.

Since introducing the OLPC program we have conducted periodic reviews of the program. What we have noted is that teachers were confident that the laptops aided technology integration, but while in 2014 we provided every secondary school teacher with a laptop, we have not yet been able to provide appropriate teacher training to support the use of the laptop in classroom instruction. With recent funding, we will commence some teacher training and we hope the opportunity will also be there to have real access to curriculum content and activities. Overall, students are expected to be engaged in self-directed learning activities and to use the laptop as a tool to build critical thinking skills and to be lifelong learners in the many uses of technology.

We also see the benefit of the students keeping the laptops, thus exposing their siblings and parents to the benefits. When we conducted the survey after the first year of implementation, the majority of parents were of the view that the laptops would positively affect their children's studies and did not see the laptops as a source of distraction for their children. The parents also felt that their children were making good and positive use of the laptops. For the students the survey showed that they felt that the laptops would have a positive impact on their studies and they claimed to use them for their homework and for educational purposes outside of the classroom.

We are optimistic about the OLPC program’s positive effects and about its ability to improve the learning environment within the classroom and in homes. Educational software has been installed on the laptops by the Ministry of Education. While a good proportion of the teachers already use the laptop to plan their work, more subject-specific software and content are required. There is general satisfaction from schools, parents and citizens with the introduction of the OLPC programme. It has reduced the inequity of access to computers and internet among students around the country. However, there is insufficient internet bandwidth within schools and the internet access and connection speed are below acceptable at some schools. But overall, the Government of Saint Lucia through the Ministry of Education will continue to support the students, teachers and principals in improving access to ICT integration. It is a work in progress and we are committed to improving the quality of learning to all.

Esther Brathwaite
From: Sanjaya Mishra  
Sent: 04 June 2015 22:02  

Dear Excellencies, Commonwealth Partners, and Colleagues,

I join the Commonwealth Education Hub team and Prof. Asha Kanwar, President and CEO of The Commonwealth of Learning (COL) in welcoming you all to this important online consultation as a precursor to the 19CCEM Ministerial Roundtable on ICT integration in Education. We are all concerned about improving access, quality and equity in education. We are also all affected by the use of Information and Communication Technology (ICT) in some way or another. Many of you will have valuable experience of ICT’s capacity to improve teaching and learning. This discussion forum provides an opportunity to share those opinions, whether general comments, views on specific aspects like technology, access or simply about priorities.

Your collective wisdom - combining input from all stakeholders, from government to academia - can help shape Commonwealth perspectives on ICT integration. I encourage you to submit as many posts on the topic as possible during the next two weeks. We are particularly interested in hearing how you are addressing challenges, examples of innovations, and viewpoints on what more needs to be done. You can contribute to the discussion simply by replying to this email.

I look forward to sharing and furthering our knowledge.

Best regards,

Sanjaya Mishra  
Education Specialist, eLearning  
Commonwealth of Learning  
Vancouver (Canada)
The Moderation Team:

**Guest Moderator:** Sanjaya Mishra (Dr.), Education Specialist, eLearning, the Commonwealth of Learning

**Education Hub Facilitators:** Beth Kreling (Ms.) and Meghendra Banerjee (Mr.)

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