New technologies: new possibilities for reaching the unreached
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New technologies: new possibilities for reaching the unreached
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1. Preamble: Asa Briggs

1.1. It is a particular pleasure (mixed with some anxiety) that I stand before Lord Briggs of Lewes in this audience delivering a lecture designed to commemorate his contribution to education. Most of you will know that Asa Briggs has been a towering figure in education circles, bringing inspiration to people like myself far beyond the shores of Britain as well as in the country itself. He was a member of the University Grants Committee, dean and later vice chancellor of the University of Sussex, provost of Worcester College, Oxford, president of the Workers Educational Association, and Chancellor of The Open University. In these capacities and more, he has been described as "one of the movers and shapers of British higher education, working to bring adult education into the modern media, helping to design the two most innovative among post-war Britain's new universities, all the while accumulating increasing personal power and authority as one of the leading educational administrators of the age." (Koditschek, page 94) He played a role as chronicler and advisor to the BBC, all the while keeping his place as a leading social historian of our time - an historian who has been more than alert to the place of the media in our modern life and its impact on our institutions and popular culture. It is my task to honour him here today - and I do so with some considerable humility.

2. Introduction

2.1. We live in a century of extremes - extraordinary extremes. Never before has the world been so prosperous, never before have so many people lived such long and healthy lives, never before have we witnessed such dazzling technology and never before have we reached, on average, such levels of education. And yet, in absolute numbers, never before have so many people lived in such poverty, never before have so many died from preventable diseases, never before have so many needed education. And it is education that fuels sustainable development, education that is fundamental to enlightened citizenship, to the peace and harmony - and even the continued life of our species on this planet we inhabit. It is an education which will help us understand what James Martin calls "the meaning of the 21st century" - a century when the extremes that have developed over time simply have to be addressed. It is an education which will have to reach many more than hitherto, and an education which must be infused with the dramatic portent of our times - a world where the extremes are not only unacceptable by any standards but capable of being solved with what we have between us. We in the developed world have more than a philanthropic interest in these human rights and human resource needs being met. Peace is fundamentally
reliant on development and development is fundamentally reliant on education. If the world is to become a better and safer place, then education will be crucial in making it so.

2.2. How are we doing in terms of numbers? I remind you of the UN Millennium Development Goals and Education for All programme of UNESCO, both of which secured commitment from a whole range of players. One must acknowledge that progress has been made but in terms of the number of people still not in basic education, much less secondary and tertiary education, there is a great deal more that needs to be done. We haven't enough schools, we haven't enough universities and we haven't enough teachers. What can be done?

2.3. It is clear that, financially, building the vast infrastructure required by traditional bricks and mortar universities, colleges and schools to meet the demand is simply not a viable proposition - even if we could staff such an infrastructure. We have come to a point where we have to accept there are other models, for HE at least, which can and do run in parallel with the conventional public sector - a sector which itself will have to change. Such models include:

the private sector - which has grown at a remarkable pace in quite remarkable and innovative ways and is providing a significant percentage of provision in many countries, not just in the developing world; the Open and Distance University movement around the world - which is moving ahead in leaps and bounds. In India, for example, 24% of students in tertiary education are enrolled in institutions of this sort; and informal learning, non-traditional learning, learning made possible by the advances in technology, to which I will return shortly.

2.4. There can be no doubt that, in all quarters, higher education is changing quite dramatically. I would argue that change is happening more quickly in the private sector than in the public sector - and that may well be the profit motive working - but the fact remains that new and innovative ways are being found to meet not only the needs of the 21st century, but also the rights of people to be educated, both in the developed and developing countries. The question is whether innovation is being embraced quickly enough and whether we have reached a scale which is necessary to the task, whether technology can help us and whether there is any way we can bring more hands to the wheel.

3. What technological advances have delivered so far

3.1. In developed countries, but also increasingly in less developed countries, technology has undoubtedly been a major catalyst for change. The Internet on its own has been dramatic enough but as other technologies have advanced we now live in a world where "merchants in Zambia use mobile phones for banking; farmers in Senegal use them to monitor prices; health workers in South Africa use them to update health records while visiting patients." And we realize that although the personal computer changed so much and unleashed all sorts of innovation, it is "the pocket-size Ultra Mobile Device (UMD) - an all-in-one phone, personal organiser, movie camera, media player, PC and fashion statement" that will deliver on the democratic promise of accessible technology which can be harnessed to educational purpose." (Futurelab July 2007).  

3.2. With this convergence of technologies ( and much more robust technology at that) as well as near universal satellite coverage, it is possible to reach people where they are, wherever they are, making learning more accessible than ever before. The total number of people who can be reached via the Internet is very large and growing rapidly: as of March 2008, there were over 1,400 million users worldwide with over 305 million people connected via broadband. A staggering 50% of the world population are mobile phone users - approximately 3.3 billion users, with an annual growth rate of 23.1% worldwide. The infrastructure to support this burgeoning use of technology is of varying quality in different parts of the
world but these advances clearly have revolutionary potential for the educational endeavour. This is already evident.

3.3. And technology has enabled sharing more - at last. We are sharing library resources, lecture material and a host of other educational aids.

3.4. Some of the largest and best collections of books in the world are being digitized and made freely available. This is an astonishing example of shared scholarship. Kevin Kelly has called the Internet a "super-distribution system" (http://www.kk.org/thetechnium/...php) and it has made access to knowledge a whole new ball game. If you had told me even five years ago that I would read long documents and even books on a very small screen, I would not have believed you. If you had told me that I could only read books on a very small screen, I would accept that and get on with it. And that of course is the situation of many, many people all over the world whose mobile telephones are effectively their window on the world of knowledge.

3.5. The rise of the Open Educational Resource movement is one of the most exciting developments made possible by the web. Several universities have placed educational resources on the web, free to use to people anywhere in the world. You can imagine how significant this is for the many people far beyond our shores who do not have access to decent libraries, textbooks and educational media. In the science and technology domains where Africa and elsewhere are so desperately short of people educated in these disciplines, it is manna from heaven. The Open University keeps statistics of the number of visitors to our OpenLearn site as do MIT and others who have joined the movement. The figures are astonishing, being accessed by millions and millions of users from virtually every country in the world.

3.6. One needs to understand however that it is universities mostly in the northern hemisphere which are making material available - and while the material relating to science might not be dominated by a particular world view (and even that could be contested), that relating to the humanities and social sciences is seriously deficient of material which would be recognisable and embraced by people whose cultures and traditions are very different. And that is before we begin thinking about language issues. These are non-trivial matters especially in the educational endeavour. If would-be and unconfident learners recognise nothing of what they know in educational materials, it is much more difficult for them to progress. We have a leadership challenge here for universities all over the world. It seems to me that if universities do not recognise the importance of changing the present dominance, it is difficult to imagine who would.

3.7. Again we can take hope from a very real project supported by the Commonwealth of Learning and that is the WikiEducator facility. WikiEducator is an online global community of scholars, teachers and trainers from remote locations who are committed to the collaborative authoring and development of free educational content for use in a variety of teaching situations. These OERs can then be re-contextualized and repackaged for use in their own teaching and learning situations. Launched in 2006, its use is growing rapidly with the number of registered users passing the 1500 mark and number of visits per month now exceeding 80,000.

3.8. The OER movement is very significant in another important respect: it has the capacity for reducing the cost of education, while at the same time diversifying the provision - especially in higher education. At the moment, for the most part, we have an expensive 'business' model where each university devises its own version of relatively straightforward material. One has to ask how different can Chemistry 1 be? Physics 1? The high level and expensive staff resource that presently goes towards presenting different courses to different students in various parts of the world is, to my mind, difficult to justify in the face of the pressing need to reduce cost and reach more people.
3.9. One cannot, of course, run away from the fact that the benefits of technological innovations remain massively disproportionately distributed. I come from Africa, and there was a time when we thought the digital divide would never be overcome, needing as it did electricity connections to be laid over vast areas of territory. Echoing the findings of the Commission for Africa Report in 2005 Calestous Juma and Elisabeth Moyer, writing in Science Magazine only last month, highlighted poor infrastructure as a continuing and critical barrier to accelerating growth "Sub-Saharan Africa is the most digitally isolated region in the world, with a bandwidth per capita that is only 1% of the world average and 0.2% of that in the United States. Not surprisingly, sub-Saharan Africa also has among the highest connectivity costs in the world. Its universities pay some 50 times more for bandwidth than do similar institutions in the United States, and connectivity cost per gross domestic product is almost 2000 times higher than in the United States. The resulting isolation of Africa's students from the remainder of the world is a serious impediment to both education and economic development."

3.10. To bring the point home the authors draw a shocking comparison with the current situation in the US "Imagine a major research university with tens of thousands of students trying to access the Internet through a single U.S. household connection. That is the present situation in most African universities. Students there theoretically have access to Science through several journal archives for the developing world. In practice, most could never download it." And whilst access to mobiles is frequently invoked as a way in which developing countries are leapfrogging the digital divide (nearly 22% of Africans have a mobile) it is worth reminding ourselves of the huge disparities in their distribution across the continent - over 83% of the population in South Africa have mobiles compared with just over 2% in Sierra Leone (AfDB/OECD 2008 African Economic Outlook).

3.11. It is impossible, therefore, to meet the needs for tertiary education at the scale of expansion required without increasing connectivity across the region. Good to say, however, that the infrastructure is finally being built and Africa's broadband internet access is set to become cheaper and faster. In 2007, for instance, Kenya, Burundi and Madagascar secured over £83m from the World Bank to help roll-out high-speed internet networks, and several new undersea fibre-optic cable systems are being constructed to increase online capacity both within the continent and to the rest of the world. A long overdue development.

3.12. With the addition of satellite technology and robust, hand-held computers it is finally becoming possible to leapfrog over several years of intermediate technology and become connected much more easily and cheaply. We all need to help make this leapfrogging possible, to turn (in the words of John Daniel) "the digital divide into a digital dividend".

3.13. Let me now pause to describe two stunning examples which demonstrate that my hopes and enthusiasm for technology are not misplaced. One example comes from India and the other from Sub Saharan Africa.

4. Tangible examples in the use of technology

4.1. An innovative, low cost and ground-breaking approach to bridging the "digital divide" was first devised by Sugata Mitra from NIIT in New Delhi nearly 10 years ago. In what has become known as the "hole-in-the-wall" experiment, he embedded a computer connected to the Internet into a brick wall near a slum. Within a few days most of the slum children were able to use the computer to browse, play games, create documents and paint pictures - without schools or teachers, or indeed any direct adult intervention. Mitra had discovered that curiosity alone could offer an inexpensive and accessible path to computer literacy for children, whatever their social, cultural or economic backgrounds.
4.2. Similar installations have since been set up in 32 rural and urban locations across India as well as at sites in other countries - with virtually identical results (Mitra et al 2005). These are described in a World Bank commissioned report as follows “Working in self-organized groups and helping each other, the children typically navigate within minutes and begin to browse in about an hour. Within three months they achieve basic computer literacy, and by nine months have achieved the proficiency level equivalent to the skills of most modern office workers.” Collaborative learning in self-organising systems at its simplest and best!

4.3. Critically, 200 children can become computer literate using one computer - which makes it a very effective and affordable multiplier of digital literacy and basic education. According to the World Bank the annual cost of a child learning through this scheme is 365 rupees, as compared with 15000 rupees for a regular primary school education and 34000 rupees for training in a school IT group. Through this scheme even children with little or no access to school gain entry to a world of quality educational content that supports their education and leads to increased confidence and self-esteem - for life.

4.4. The other example I will invoke is an Open Educational Resource site - the Teacher Education in Sub-Saharan Africa (TESSA) project. TESSA was born out of a recognition of the colossal need for teachers and health workers in Africa. With 41% of the population under 15 (AfDB/OECD 2008 African Economic Outlook) an additional four million teachers are required to meet the EFA goal of universal primary education by 2015. And to that must be added the need to substantially upgrade the teachers and health workers already in post. Factor in the human devastation being wreaked by AIDS and you get a glimpse of what is required of the African education system. While we in the UK are well on our way to achieving our 50% enrolment target, Africa at present has something like 2-3%.

4.5. OERs have the potential to play a pivotal role in democratising access to knowledge in ways that have a special relevance to education systems in developing countries. Just one example is the TESSA consortium (of which The UK Open University is a partner) which is working across eleven sub-Saharan African countries, in five different languages. It uses OER accessed via satellites with handheld, mobile devices and is dedicated to school-based teacher education.

4.6. The project provides a wealth of original OERs to support teacher development in the core curriculum areas of literacy, numeracy, science, life skills and social studies and arts. For TESSA the use of OERs has several advantages: easy access to materials in different formats to be assembled into learning pathways, and the ability to enhance, adapt and modify materials for local environments and purpose. Through the design of the OERs, institutions can, moreover, be supported in moving from traditional teacher-led methods of teaching to more democratic, learner-centred models. Encouraging feedback from one South African teacher was "through the TESSA materials I have learnt methods that give me the inspiration, confidence and skills to be the teacher I have always wanted to be."

4.7. I draw attention to these projects because they are examples of what can be done now, with the technology we have - and in very disadvantaged parts of the world at that.

5. I want to move now to look at trends in the world of Web 2.0 and see if we can draw some conclusions that will help me develop a theme that seeks to find ways of harnessing new technologies and involving more people in the general education endeavour - thus reducing our reliance on traditional teachers and physical facilities. I will point to two studies that help us here:

5.1. The first is based on some research done by Forrester Research and described in a book called Groundswell. The study describes what they call a 'groundswell' (the title of the book): “this spontaneous movement of people using online tools to connect, take charge of their own experience, and get what they
need - information, support, ideas, products, and bargaining power - from each other" (Page x). They categorise what is taking place into a series of activities, three of which are as follows:

5.1.1. People creating: blogs, user-generated content, and podcasts. They describe the proliferation of rather simple tools that make it possible for anybody to be a broadcaster, a film maker and distributor (YouTube, Flickr), anybody to be a publisher, for people to take data from a variety of sources and create 'mash-ups', increasingly to add to the sum of knowledge in new and interesting ways, ways which challenge our established notions of authority and authorship - and indeed of scholarship. These may be written pieces, pictures, videos, commentaries, music - and all encourage commentary - and relationship building.

5.1.2. So you see this enormous pent-up creativity - and this is something that is not only populating the web with new and interesting material from a whole range of new sources (new knowledge, some would say), it is creating new learning material and new learning communities, new 'curricula', if you like, from previously unheard voices. Give people the opportunities (and they haven't had these kinds of opportunities before) and we see this astonishing result. If we extend this opportunity into different communities, there can be no doubt we would see the web becoming a much more diverse and representative reflection of the richness of the world's population.

5.1.3. People connecting and people collaborating: social networks and virtual worlds, wikis and open source. We now have tools that make it possible for people to connect with all others over the world, people they might never physically meet - and it seems that they have a huge hunger to do so. Indeed never before have so many people been able to communicate with so many - and in so many different parts of the world. They communicate but they also want to collaborate. Students meet online, make connections and form relationships - and they also form learning communities (often quite rigorous learning communities, often on unlikely subjects), collaborative in practice with peer-to-peer mentoring and much more besides. It turns out that there are lots of people who enjoy the role of the teacher, informal though that may be.

5.1.4. There are also powerful tools that support multiple contributors to sites that build content and there is a shared responsibility for creating and maintaining that content. The best known is Wikipedia (the eighth most popular site on the web) with over 2 million articles and growing, maintained entirely on a non-profit basis. This same sort of co-operation drives other forms of online collaboration, including open source software products like Linux, Apache (a Web server) and Firefox (a Web browser). The Open University uses open source software called Moodle to drive its Virtual Learning Environment. These are communities of practice; they give opportunities for relatively inexperienced people to work alongside very experienced ones, almost like old-fashioned apprenticeships.

5.1.5. These sites demonstrate two things in particular. One is that people are ready to volunteer their time and knowledge to what they consider to be a good cause. Who would have imagined that millions and millions of people would give their time, uncompensated in monetary terms, to create this amazing library in cyberspace? But then, as John Naughton reminds us in his book A Brief History of the Future: The Origins of the Internet, not a single line of the computer code which underpins the Net is proprietary; and nobody who contributed to its development has ever made a cent from the intellectual property rights in it. (Page xii) This is a gift culture and its currency is something different: reputation, expression, whim, maybe just the feel-good factor, whatever it is, it is providing the energy that drives a new kind of enterprise - and it is also making the outcome better for everybody. It is also a gift culture that gives us promise and hope for what is possible in the context of our theme here today.

5.1.6. The second thing these sites demonstrate is that rich learning (and teaching) can take place in very informal settings, quite outside institutional strictures - and that learning is valuable even though its
'currency' will be included in none of our formal statistics about education. This is something that has to change.

5.2. The second study, the Horizon Report (2008), researched the top emerging technologies that are likely to have a large impact on teaching and learning. This is put together by the New Media Consortium, in collaboration with the EDUCAUSE Learning Initiative. Not surprisingly their findings overlap with those identified by the Forrester team - with one alarming exception: "the gap between students' perception of technology and that of faculty continues to widen. Students and faculty continue to view and experience technology very differently. Students have embraced social technologies like FaceBook and many similar platforms in unprecedented numbers yet these technologies remain a mystery to many on campuses. Webware tools with clear potential for education are meeting the same reception: faculty are often either unaware of tools like Google Docs and Swivel, or have difficulty integrating them into educational processes." (Page 7) There is more of the same but the authors conclude academics ignore these trends at their peril. It seems to me that we too ignore them at our peril. They represent powerful agents for change as well as seeds of hope for how that change might be engineered.

6. I want to argue here today, in the context of the theme of this conference, that these trends are vital to our understanding of how we leverage what is happening in cyberspace, leverage this gift culture and mobilise people's natural propensity to connect, collaborate, volunteer their time and engage in both teaching and learning activities.

6.1. It seems to me that the technology has vastly improved our capacity (at a reasonable cost) to:

Reach people we have not reached before - person to person, group to group, school to school, institution to institution;
Enable them to contribute to the content available on the Web from their communities and cultures and language groups;
Include them in learning communities and provide them with learning resources;
Enlist people all over the world in mentoring and tutoring activities (both formal and informal); and
Enlist their help also in extending learning possibilities where they happen to be physically located; mobilising (and I use the language of war and campaigns advisedly) in effect a giant volunteering effort. Indeed not all of the activity need be strict volunteering only. There is quite a well-established activity called 'service learning' where academics have found ways of giving credit to students for their service activities. This would encourage students and accelerate their propensity to join in either physically - in some giant kind of Peace Corps - or virtually, in the ways I have suggested.

6.2. This is not as far-fetched as you might imagine. Already we have examples of the internet being used by the young people of today to devise innovative solutions to global challenges - and using technology to share ideas and mobilise resources to create a new kind of society for the 21st century:

6.2.1. Take HealthCare Volunteer (http://www.healthcarevolunteer.com/) for example, a non-profit organization which was launched in 2006 by Neilesh Patel, an American dental and medical student, who realized the need for a free non-profit portal that connects all volunteers interested in health care to volunteering opportunities worldwide - anywhere, any time, and for any length of time. The need for global healthcare has exploded in recent years: at least 1.3 billion people worldwide lack access to the most basic healthcare, often because there are no health workers to take care of them. "The global population is growing, but the number of health workers is stagnating or even falling in many of the places where they are needed most," said Lee Jong-wook, Director General of the World Health Organization, in 2006. The World Health Report recommends that in order to achieve this goal, we need "the right workers with the right skills in the right place doing the right things." With a mission to "empower any individual to make an impact in community and global health" HealthCare Volunteer is working hard to fulfil that need, and is currently the largest listing of health-related volunteering
opportunities in the world, accessed by thousands of volunteers and job seekers from more than 118 countries.

6.2.2. Syinc (http://www.syinc.org/) is another example - formed by a young ex-psychology student, Bernise Ang, to connect young Singaporeans to take action on a wide range of social issues from HIV/Aids to social entrepreneurship.

6.2.3. Another website - Brainstorming (http://www.brain-storming.info/index.php) - was formed in 2004 by Talio Delgado during her European Voluntary Service project within ARSIS (The Youth Cultural Association from Romania) as a virtual channel for young people from around the world to contribute stories, essays and photojournalism on everything from human rights to social exclusion. There are many more.

6.3. And there is already an acceptance, encouraged by the last UNESCO World Conference on Higher Education in 1998 (and to be further encouraged by the next one in 2009 in its theme), that universities play a key role in what has come to be known as 'civic engagement'. There are some impressive examples of 'service learning' and 'campus compacts' from which we can all learn. It seems to me that there is a resurgence in universities' commitment to civic engagement (for example, in the Talloires Network: http://www.tufts.edu/talloiresnetwork/) and what I am suggesting here takes the notion to a whole new level, playing it out on both the local and international stage, both in physical spaces as well as cyberspace. What I believe we can expect of our universities, wherever they may be, is that they recognise the challenges of this century and take the lead in addressing them.

7. There are clearly many challenges in the parallel routes I am suggesting:

7.1. There are challenges to governments and funders to give serious priority to the cyberinfrastructure of countries and regions, not the least of which are expanded phone networks and broadband coverage. The challenge extends to policy-makers and quality assurance regimes to devise new forms of encouragement that recognise the new landscape (including the informal ones) and make engagement with it a non-negotiable.

7.2. There are challenges to academics in grasping the opportunities and learning to understand the nature of what John Seely Brown calls "21st century learningscapes" (page 29) The challenges extend to devising new models of assessment, new bridges from the informal to the formal. The challenges further extend to the research domain which I have had insufficient time to explore.

7.3. There are challenges to institutions to take on the leadership of not only encouraging their students and staff to take on volunteering roles but lead the campaign to mobilise at large scale both the teaching and mentoring roles but also to populate the web with local material.

7.4. There are challenges to the private sector in being ever more bold in their conception of social responsibility and using their huge global resources to really make a difference. One recognises Microsoft and the Gates Foundation, The William and Flora Hewlett Foundation which have enabled the OER movement to develop as well as CISCO and others which have made contributions.

7.5. The challenge to ordinary people (like you and I) but especially students (as the leaders of tomorrow) to answer the call to mobilisation and throw their considerable talents into the cause.

8. Conclusions
8.1. I am enormously encouraged by the dazzling advances in technology and the hope they give us for reaching people in ways that would have been impossible not so long ago. I am also enormously encouraged by how (enabled by technology) we are learning to share our common wealth. The most abiding uplift for me comes from my perception of more and more people involving themselves in activities with purpose beyond themselves. It seems to me that it is especially young people who are demonstrating their understanding of what James Martin calls "the awesome meaning of the 21st century." (page 401)

8.2. Douglas Alexander, the British Secretary of State for International Development, in a speech last year had this to say: "We can't say our generation doesn't have the financial resources to eradicate global poverty. We can't say our generation doesn't have the technological capability and scientific know-how to end needless suffering. And we can't say our generation does not have reason to do it. It is up to us. It is our shared responsibility. It is our shared opportunity. And, working together, I believe it can be our shared achievement." (Washington, July, 2007) I couldn't put it better myself.

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