

ICTs and transformation in Africa: Three perspectives

From The eLearning Africa Report 2014

Is modernity destroying African teaching traditions?

Bitange Ndemo

Since independence, education in most African countries has remained static. The content is largely foreign. The methods of teaching are, in most cases, chants that have little meaning to the future development of the learners. The systems are exam-oriented and have converted pupils into robots of a kind. Historical events that shape our future and how we think and act in the days to come are not part of the syllabus. This is why it is of significant urgency to rethink the archetype of our education today.

Africa's learning methods through imitation and the oral tradition of knowledge transmission are dying. Modernity is destroying the

little that was transmitted – education that was a lifelong experience is now largely an event in life. Children used to learn the entire flora and fauna that was within their environment. There was no pressure to master the language, the environment or the patterns of rainfall, it simply was an experience that meant that, at an early age, a child would be able to tell which snakes were poisonous and which were not. Most children knew how to deal with a snakebite largely through imitation of what their parents did. In some instances, they acted as first responders in an emergency situation, administering first aid if there was no adult nearby. Depending on where the bite was (mostly around the legs), they would quickly look for a tree with flexible bark, tie the anterior side of the lesion, slice the lesion wide open then suck the blood and spit it. This was done repeatedly while making arrangements to get the patient to hospital.



Africa's traditions of teaching through imitation and the oral transmission of knowledge are dying out

Adapted by permission from: Elletson, H. and MacKinnon, A., eds. 2014. *The eLearning Africa Report 2014*. Germany: ICWE. For more information please visit www.elearning-africa.com/report2014 or contact info@icwe.net.

Similarly, children learnt which plants were harmful and which were not. As they watched their parents forage for fruits in forests, they knew which not to touch or eat. Some plants were medicinal. It was possible for a fairly young adult to prescribe which plant you needed to use in the event you had constipation. Crude as it may sound, it was invaluable knowledge. Unfortunately, it was not recorded anywhere due to the nature of oral traditions. This is where we need some intervention. The knowledge is still out there and there is still time to leverage technology and capture it for posterity.

Although formal education and its focus on literacy and numeracy is critical to enhancing our knowledge base, it was introduced as a superior intervention over 'primitive' African oral tradition. Many of those who became literate began to despise and discard African knowledge. This, in my view, is what has led to the glaring cognitive dissonance among Africans. Ngugi wa Thion'go, in his book *Decolonizing the Mind*, noted: 'The attitude to English was the exact opposite... English became the measure of intelligence and ability in the arts, the sciences and all the other branches of learning. English became the main determinant of a child's progress up the ladder of formal education.'

The language of education

Throughout Africa in the early 1960s, the language of education was not the language of the people's culture. The imitation of Western values has changed African behaviour and attitudes. As a result, African languages have become static compared to dynamic European languages. It is much easier to express ourselves as Africans in foreign languages because new words, for example, have not been reflected in local languages. Political rallies across Africa are mostly held in European languages. Reverting to local languages will be as difficult as it was adopting European languages. At this crossroads, Africa must make a conscious decision to move on and deepen its understanding of these foreign languages within the African context, incorporating African methods of learning.

Learning is a complex process. In an article by Rahima Baldwin Dancy on Rudolf Steiner, who founded Waldorf education, it is argued that understanding the nature and development of the young child can help parents nourish their child's whole body, mind, emotions and spirit. It was through Steiner that Dancy first became aware of learning through example and imitation, principles that she had observed in her own children without paying them much conscious attention. A child younger than seven, up to the change of teeth, is essentially imitative. It learns by seeing and copying what is done around it.

It is with such knowledge that we can bring about reforms to the current systems of education, where children at an early age are forced into rote learning. There is no scientific justification for such learning. Indeed, in some of the most innovative countries, like Norway, education is a pleasurable experience. In the early years of primary school, the students spend most of their time playing educational games, learning social structures, the alphabet, basic addition and subtraction, and basic English skills.

In Grades 2–7, children are introduced to maths, English, Norwegian, science, religion, aesthetics and gymnastics, complemented by geography, history and social studies in Grade 5.

No official grades are given at this level, however; the teacher often writes a comment-analysis and sometimes an unofficial grade on tests. Most educational systems in Africa put pressure on children with exams from the start. Even at nursery children go through a rigorous test. The system seeks to identify intelligent and non-intelligent pupils early on, even before the children develop their talents. With a growing number of smartphones and content platforms, Africa must aggressively develop local content and widely distribute it to both young and old learners. Technology has been created for Africa and can remedy its many shortfalls, helping it to 'leapfrog' and join developed nations within the shortest period possible. However, we know that in the past there has been resistance in adopting new learning methods, which teachers fear may replace them.

Technology can transform our schools. Research shows that students learning through visuals retain much more content than those who do not. Furthermore, technology may be the only tool that brings inclusivity in learning, giving time for slower learners to catch up. Even with languages, technology can assist children in learning multiple languages, including local languages. With such knowledge, we must therefore persuade African governments and teachers to embrace technology in classrooms.

There is a need to reform our learning institutions to make education a pleasurable experience without necessarily focusing on exams. We now have enough justification to leverage the advances in information technology and revolutionise how children learn. Change in our educational systems is imperative to meet the demands of the future – we must develop Africa-centric content in order to learn from our own past mistakes.

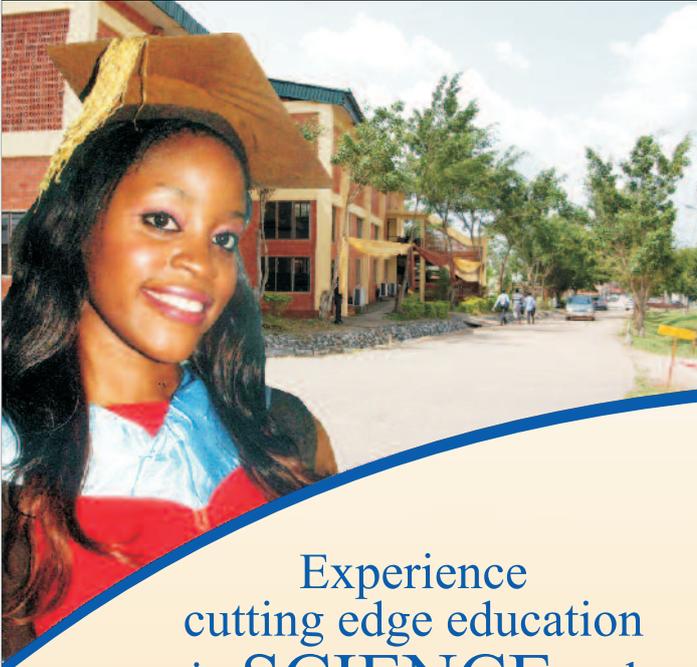
The heart of the global economy

Maggy Beukes-Amis

The extraordinary rates of growth achieved by many African economies in recent years have been possible, above all, because of developments in information and communication technologies (ICTs).

ICTs have brought Africa into the heart of the global economy, giving businesses a unique opportunity to expand. The growth of the middle class – whose population is estimated to increase by 100 million by 2020 – has put Africa's consumer spending on a par with India and ahead of Russia. Africa has the highest growth rates in telecoms in the world, with rocketing mobile subscription rates further accelerating the social and economic change taking place in much of the continent. ICTs have also facilitated the development and spread of new opportunities for education. This, in its turn, has had a profound effect on growth. It is the key to Africa's future prosperity and to making the most of the single advantage we have – the fact that we are a young continent, with a higher proportion of young people than anywhere else on the planet.

Africa's telecommunications revolution has only just begun, though. Mobile penetration rates may be rising in every African country, but some markets – especially with regard to rural areas – remain underdeveloped. In some countries, there are more mobiles than people, yet many remain cut off from the network. In Nigeria, for example, mobile penetration is at 60 per cent, but human penetration only at 26 per cent, as mobile users own on average



Our programmes at a glance

Experience cutting edge education in **SCIENCE** and **TECHNOLOGY**



@ Bells University of Technology

The Bellstech platform makes a positive difference. Our innovation and unique abilities drive the culture of excellence that is our identity. We harness the power of information and communication technology to produce graduates brimming with academic excellence and social relevance.

Come over and make Bells University your launch pad.

COLLEGE OF NATURAL AND APPLIED SCIENCES (4 YEARS)

- B. Sc. Microbiology
- B. Sc. Industrial Chemistry
- B. Sc. Biochemistry
- B. Sc. Chemistry
- B. Sc. Physics with Electronics
- B. Sc. Applied Mathematics with Statistics

COLLEGE OF FOOD SCIENCES (4/5 YEARS)

- B. Tech. Food Technology
- B. Tech. Food Technology (Food Science with Business)
- B. Tech. Biotechnology
- B. Sc. Nutrition and Dietetics (4 year Programme)
- B. Sc. Culinary Science and Hospitality Management (4 year Programme)

COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGY (5 YEARS)

- B. Tech. Computer Science
- B. Tech. Information Technology

COLLEGE OF MANAGEMENT SCIENCES (4 YEARS)

- B. Sc. Business Administration
- B. Sc. Finance and Banking
- B. Sc. Economics
- B. Sc. Accounting
- B. Sc. Project Management
- B. Sc. Transport Planning and Logistics

COLLEGE OF ENGINEERING (5 YEARS)

- B. Tech. Biomedical Engineering
- B. Tech. Computer Engineering
- B. Tech. Electrical/Electronics Engineering
- B. Tech. Mechanical Engineering
- B. Tech. Mechatronics Engineering
- B. Tech. Telecommunications Engineering

COLLEGE OF ENVIRONMENTAL SCIENCES (4/6 YEARS)

- B. Sc. / M. Sc. Architecture
- B. Tech. Building Technology
- B. Tech. Quantity Surveying
- B. Tech. Surveying and Geoinformatics
- B. Tech. Urban and Regional Planning
- B. Tech. Estate Management



Bells University of Technology Ota, Nigeria

KM 8, Idiroko Road, Benja Village, P.M.B. 1015, Ota, Ogun State.

Tel: 0805-600-4267, 0802-836-8125, 0708-713-8753

Website: www.bellsuniversity.edu.ng

...only the best is good for Bells





© Shutterstock / karelnoppe

Despite challenges in ICT infrastructure, Africa can boast of a number of e-learning initiatives that were not available five years ago

2.4 SIM cards each. What is coming next is better broadband access – bandwidth growth in Africa is second only to the Middle East – more smartphones, more tablets, more indigenous telecommunications solutions and more African innovation.

Our continent is only just beginning to seize the opportunity, but we are on the threshold of a great new golden age. In Namibia, we have already begun to build the kind of telecommunications infrastructure that will equip it to make the most of the opportunities ahead. What we have done, in many ways, is to create a template that can be adopted by other African countries. In comparison to its neighbours Botswana and South Africa, Namibia's telecommunications industry was slow to develop through the 1990s and early 2000s, partly because of a lack of competition in the fixed-line and mobile markets. This was largely because of the caution exercised during the gradual privatisation of telecommunications, which it saw as a 'natural monopoly'.

African countries have a delicate tightrope to tread when it comes to privatisation – though competition in the market does indeed spur on the rapid development of infrastructure and bring down prices, it can also reinforce internal digital divides, particularly between urban/rural areas and allow the sector to be dominated by foreign firms with little or no benefit to national industry. This has changed rapidly in recent years, with competition entering the market, and the clear transition from a nationalised industry. The sale of 34 per cent of MTC, the national mobile telecommunications company, to Portugal Telecom in 2006 boosted the company's good fortunes and facilitated the roll-out of 3G.

More recently, in November last year, Telecom Namibia introduced LTE technologies through its TN Mobile initiative, making more 3G and 4G services available to Namibians. The WACS (West Africa Cable System) undersea fibre-optic cable, from London to Yzerfontein, landed in Namibia and went live in December 2012. It brings the potential for a substantial improvement in broadband across the country.

These developments have occurred, in part, thanks to the leadership of current Telecommunications Minister Joel Kaapanda, who has pushed through numerous reforms to ring down prices, improve regulation and stimulate efficiency – most importantly through the 2009 Telecommunications Act. The importance to e-learning of developments in telecommunications, though they frequently occur outside the education sphere in the worlds of politics and economics, is clear.

Africa is still the continent where broadband is least affordable – that is, where the cost of a subscription is highest compared to wages. Here Tunisia and Mauritius lead the way as the only countries with rates comparable to those found in Central Europe. But in much of Sub-Saharan Africa, the cost of a year's broadband subscription is over 50 per cent of the average annual salary – though the costs are, as is to be expected, dropping at the fastest rate in the world.

While the cost of using basic infrastructure remains high, many of our e-learning dreams will fail in the face of cold, hard reality. Because while an e-learning project may be easy to set up with funds from donor organisations, governments and private sources,

keeping it running sustainably is about being able to afford the continuing use of the infrastructure.

The fact that 90 per cent of telecoms workers who took part in the Learning Africa Survey 2014 felt they were being overcharged for their internet access shows that we still have a long way to go. Many countries are falling behind, as Namibia was in the 1990s. But Namibia's example shows that insightful leadership, accompanied by the sort of healthy competition that does not marginalise or exclude people, can help a country grow the modern telecommunications networks that Africa so badly needs.

E-learning and the post-2015 agenda

Aida Opoku-Mensah

In Africa, despite challenges in ICT infrastructure, a great deal is being done by governments. The continent can today boast of a number of e-learning initiatives that were not available five years ago. This is due to the fact that between 2001 and 2011, six of the world's ten fastest-growing economies were African and, while yearly global growth has been estimated at 2.7 per cent, Africa has been growing at five per cent every year. Furthermore, all five sub-regions of the continent grew faster than the global average, with the highest rate being 6.3 per cent and the lowest 3.5 per cent.

A prosperous Africa means spending on all sectors of the economy. According to the 2011–16 Regional Forecast and Analysis by Ambient Insight, a market research firm, e-learning in 16 African countries is just over 15 per cent, 'revenues reached US\$250.9 million in 2011 and will more than double to \$512.7 million by 2016'. Senegal leads all surveyed nations in terms of e-learning growth, at 30 per cent annually over the next few years. The rapid growth is due to a combination of factors, including support from governments, businesses and universities. This is making Africa one of the most dynamic e-learning markets in the world.

Ambient Insight suggests three major catalysts for the boom in the African e-learning market – the wide-scale digitisation of academic content in almost all countries on the continent; the explosion of online enrolment in higher education; and the hike in the adoption of learning in corporations working in booming economies. As a result we have well-known African e-learning institutions, such as the African Virtual University (AVU) and the University of South Africa (UNISA), with new ones emerging. In 2012 the Kenyan government funded the development of a new online education institution called the Open University of Kenya. Through funding from the African Development Bank (AfDB), the AVU Capacity Enhancement Program (ACEP) launched a training programme on 18 November 2013 to equip AVU's partner institutions with e-learning skills in areas such as ICT instructional processes, technology support and management of e-learning – much needed human development for the African continent.

The fact of the matter is that such initiatives are a result of a dramatically increased demand for higher education that cannot be accommodated by traditional campuses, making e-learning a necessity in Africa and not a luxury as many thought in the early days of the ICT revolution. Ambient Insight predicts that packaged content is the self-paced learning product that will generate the highest revenues in Africa throughout their forecast period

2011–16, as there is a strong demand for digital language learning content, particularly from academia. Also, 'by 2016, Angola will displace Tunisia as the fourth-largest buying country (of learning products) in the region... [and] Nigeria will be the second-largest buying country after South Africa', says Ambient Insight.

The rise of a stronger and more assertive Africa, coupled with good progress made on some of the economic and social indicators of the Millennium Development Goals (MDGs), such as decreased rates of poverty and almost 90 per cent primary school enrolment in most countries, provides fertile ground for an e-learning revolution in Africa.

However, there are some shortcomings in terms of progress towards the MDGs, namely inequality characterised by spatial and demographic disparities in access to basic social services, including education. Gender disparities in school completion rates and unequal access to health, water and sanitation facilities are worrying, and call for targeted interventions.

This is not just in Africa. Globally there is 'an education, learning and skills crisis. Some 60 million primary school-age children and 71 million adolescents do not attend school', according to the report of the High-Level Panel (HLP) of Eminent Persons constituted by the UN Secretary-General on the post-2015 development agenda. The report also claims that 'among the world's 650 million children of primary school age, 130 million are not learning the basics of reading, writing and arithmetic, and a recent study of 28 countries found that more than one out of every three students (23 million primary school children) could not read or do basic maths after multiple years of schooling'.

Dynamic content

In some parts of Africa, e-learning initiatives are helping to solve some of the learning and skills crises described in the HLP report. The Kindle e-reader, for instance, is helping address the chronic shortage of textbooks in Ghana. Kindle provides children with access to 140 titles, including textbooks. According to one of the beneficiaries in a primary school in the town of Suhum in Ghana's eastern region: 'The reader makes things better. It helps me to read and spell. Now it's easier for my parents to help me with my homework, because I always have the books I need.'

Kindles have been distributed to this school as part of the iRead 2 programme of Worldreader – a charity organisation that is trying to eradicate illiteracy by delivering the largest culturally relevant library to people. There are similar Worldreader initiatives throughout Africa. In Ghana, primary schoolchildren also have access to local content, namely Ghanaian stories.

According to a 2012 survey in Senegal by the GSMA Sub-Saharan Africa Mobile Observatory, 27.8 per cent of school pupils reported they had acquired better knowledge and 6.5 per cent understood lessons better with content from ICTs. Accenture estimates that the cost of books for a four-year secondary education in Africa is US\$200–\$400. Books provide an inflexible curriculum that cannot easily be updated, whereas with e-readers, students spend less than \$100 and can access hundreds of books from one device thanks to the dynamic content.

Africa's recent growth has not been job-rich. More progress can be achieved if concerted efforts are made to add value to raw

Youth in development

In much of Africa, 46 per cent of workers earn less than US\$1.25 a day. Properly targeted training in skills development for improved livelihoods for this particular group, using e-learning, could not only reduce poverty but also contribute to the economic transformation agenda. Similarly, Africa's young workers are mainly underemployed or self-employed in the informal or agricultural sectors, while youth employment is dependent on the availability of high quality jobs. The introduction of skills development programmes for youth would go a long way in building their and Africa's future, which will also contribute to building the sustainable and inclusive growth still eluding the continent.

materials through an aggressive industrialisation drive that generates employment opportunities for a large majority of the workforce. A more diversified economic structure will also be critical in strengthening Africa's resilience to economic and climate-related shocks. In order to achieve inclusive social and human development, and therefore either the MDGs or whatever set of goals comes after 2015, Africa must undergo structural transformation that brings about inclusive growth.

What would structural transformation entail? The key elements of an effective transformation agenda for Africa comprise a declining share of agriculture in GDP and employment; the transformation of rural areas into vibrant hubs of agri-business and industrial activity; the rise of a modern industrial and service economy; the translation of Africa's youth bulge into a demographic dividend; access to social services that meet minimum standards of quality regardless of location; reduced inequality – both spatial and gender-based; and progress towards an inclusive green growth trajectory, underpinned by quality education for all Africans.

The potential of e-learning to facilitate the transformation of African economies is enormous and cannot be overstated. According to the High-Level Panel of Eminent Persons constituted by the UN Secretary-General on the post-2015 development agenda: 'The first priority must be to create opportunities for good and decent jobs and secure livelihoods, so as to make growth inclusive and ensure that it reduces poverty and inequality. When people escape from poverty, it is most often by joining the middle class, but to do so they will need the education, training and skills to be successful in the job market and respond to demands by business for more workers.'

Technology, particularly online education, can really assist in this vast re-skilling challenge, which embraces both adult and school-aged Africans. In the words of the Africa MDG Report 2013, the continent 'needs to approach job creation from a development angle, not just as an electoral issue. National development visions, plans and strategies should focus on jobs'. In doing so, there will be a need to foster 'an environment for businesses to thrive, paying particular attention to human capital accumulation, especially by aligning the education system with labour market realities'.

A common regional position

The Common African Position (CAP) on the post-2015 development agenda adopted by African heads of state and

government of the African Union in Addis Ababa, Ethiopia, on 31 January 2014 has in place six pillars for Africa's transformational agenda. These are:

- Structural economic transformation and inclusive growth
- Science, technology and innovation
- People-centred development
- Environmental sustainability, natural resources management and disaster risk management
- Peace and security
- Building partnerships

The CAP (2014: p. 10) states categorically: 'We must achieve excellence in human resources capacity development through an improvement in the quality of education and training by investing in learning infrastructures; increasing the use of ICT; ensuring higher completion rates; promoting pre-schooling [and] integrated adult education; and improving the quality and conditions of service of educators and trainers.' This assertion is based on the premise that any economic structural transformation agenda needs a sound education policy to accompany it. The advantages of e-learning are that it can deliver timely and cost-effective learning for this agenda.

Prospects for home-grown e-learning opportunities abound in Africa. This is one area that could be examined with respect to economic opportunities for Africa's youth. E-learning is both a tool and a means of employment, stimulating the emergence of creative and local content industries in Africa. As mobile broadband penetration increases, the demand for local and relevant content and applications will also increase. Though at their nascent stages, these industries are already making an impact in their countries. For instance, the creative industries in Kenya are now the fifth-largest contributor to its national economy, providing more than 62,000 jobs, with employers including more than 50 tech hubs, labs,

Kindle in Kenya

'We launched the first pilot project in February 2013 after I visited several schools in the Oyugis area of western Kenya. Although the schools were well organised with friendly and helpful teachers and pupils, there were no teaching materials in use apart from a wall painted as a chalkboard and some sticks of chalk. However, 3G coverage was available and my Kindle device worked flawlessly. During various discussions with schoolteachers locally, and some who were also visiting from the UK, the germ of an idea was formed: to see if e-readers with suitable teaching materials might help transform and improve the resources available to teachers. From the outset, the aim was to encourage teachers, technologists and publishers in Kenya to participate in the project, to encourage collaboration and the sharing of ideas, experiences.'

'The project has now included eight schools, both primary and secondary. Both the teachers and the students enjoy using the devices, which are solar-charged. A book purchased on one Kindle can be shared on several.'

– Jeremiah O., Kenya

incubators and accelerators. This scenario will soon be repeated across nearly all of Africa, because e-learning has a local content component that provides business avenues for locally-based companies.

Strong government leadership is required in providing the necessary enabling environment to stimulate growth in this sub-sector. For instance, South Africa's broadband policy of 20 November 2013 calls for an applications development fund with incentives for the localisation of content, platforms and applications. The potential for the development of creative and local content industries in Africa is significant. With increased penetration of smartphones and mobile broadband, there will be a big demand for locally relevant content and applications, and hence the need for countries to promote entrepreneurship in local content and applications.

Conclusion

Globally, e-learning plays a vital role and is a cost-effective means of education provision. Adoption, utilisation and optimisation have still got a long way to go in Africa, but there have been tremendous strides. Not having technology-savvy education

professionals does not help and many universities on the continent are still not at the forefront of technology use. Meanwhile, much of the growth in this sector has failed to employ Africans. In developing strategies for sustained growth, countries will have to implement national strategies to promote the use of technology for education, along with the prioritisation of investments in the ICT sector, while paying serious attention to infrastructure development, and sensitising and re-skilling educators.

DR BITANGE NDEMO is a leading columnist, senior lecturer at the University of Nairobi, honorary chair of the Alliance for Affordable Internet and the former permanent secretary at the Ministry of Information and Communication in Kenya.

DR MAGGY BEUKES-AMISS is head of the department of ICT Studies at the University of Namibia, deputy chairperson of the ICT Steering Committee of the Namibian Ministry of Education and chairperson of the Telecom Namibia Board.

DR AIDA OPOKU-MENSAH is the special advisor, Post-2015 Development Agenda, at the United Nations Economic Commission for Africa (UNECA), Addis Ababa, Ethiopia.