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# When the last mile becomes the longest mile: a critical reflection on Africa's ability to transform itself to become part of the global knowledge society

M Holmner and J J Britz

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M Holmner  
Department of Information Science  
University of Pretoria  
South Africa  
[Marlene.holmner@up.ac.za](mailto:Marlene.holmner@up.ac.za)

JJ Britz  
University of Pretoria and University of Wisconsin-Milwaukee  
Milwaukee  
United States of America  
[britz@uwm.edu](mailto:britz@uwm.edu)

## Abstract

*In this article the question is asked to what extent Africa can become a knowledge society characterised by global connectivity and the ability to not only utilise knowledge but also to generate new knowledge in support of sustainable development, economic growth and human wellness. The question is approached from two interrelated perspectives. The first perspective focused on the importance to connect people via communication networks to the global body of knowledge. This is the last mile problem. In the second perspective the focus fell on human capacity building and the ability of people to not only fully utilise the information but also their ability to create new knowledge. This is referred to as the longest mile problem. It is concluded that most African countries have made tremendous strides in the last decade to address the last mile problem. This is evident from the increase in broadband availability as well as the rapid growth in the use of mobile technologies. It is furthermore concluded that Africa still has a long way to go with regards to human capacity development. It is argued that in many respects this still remains the longest mile for Africa in her efforts to become a prosperous knowledge society.*

*Although some progress has been made with regards to primary and secondary education there is a lack of investment in tertiary education, and with a few exceptions the research infrastructure on the continent is still largely underdeveloped. This seriously hampers Africa's efforts to become an equal partner in the global knowledge economy.*

## Introduction

It is evident that many African countries aspire to become knowledge societies allowing them to participate as equal partners in the global information based economy. In this article we define knowledge societies as those societies where:

- knowledge has become the most important production factor (Maassen 2007; Kefela 2010);
- there is a culture of knowledge production underpinned by a higher level of education;
- the flow of knowledge is supported by a globally connected information infrastructure and;
- the focus is not only on the use of modern information and communication technologies (ICTs), but also on “content, meaning and knowledge” (Evers 2000).

Within this knowledge society information ethics has become a critical component in building an inclusive knowledge society (Kuhlen 2010). Information ethics is primarily concerned with the problem of who should have access to what information (Fallis 2007). According to Fallis (2007) the core issues of information ethics therefore include intellectual freedom, information privacy, intellectual property and equitable access to information. Due to the advances in information technology information has become easier to create, access and distribute as a resource. However these advances have not ensured that everyone has equal access to this resource (Eining & Lee 1997). In academic literature this unequal access to ICT is often referred to as the digital divide (Norris 2001; Van Dijk 2006; Goldfarb & Prince 2008; van Deursen & van Dijk 2011; Warschauer 2012). According to the World Bank (2009), African governments have started focusing on providing affordable ICT services to its citizens in the hope of bridging this digital divide. Recent efforts to increase their internet connectivity and to expand mobile coverage are illustrative of this commitment (World Bank 2009).

Africa has indeed been ‘introduced’ as a digital role player to the global economy and the future prospects for further economic growth and prosperity

are very promising (Mahajan 2009; Ewing 2011). Although these technology initiatives and reports on economic growth on the continent provide certainly enough reasons to be optimistic about Africa's future there are some reasons for concern. For example, the information infrastructure (e.g. internet connectivity, broadband availability and cost to access digital information) in many African countries is still not on par with the rest of the world. Also, the physical infrastructure (e.g. roads, harbours, airports), which is essential to participate successfully in the global knowledge economy, have not been well maintained over the years and the levels of education is unfortunately still very low in most African countries (Commission for Africa Report 2005; Gwilliam 2011). Most African nations have not invested enough in their human capacity building (OECD 2005, 2006). This has resulted in not only an under skilled workforce but also in making Africa a knowledge importer. This fact is clearly demonstrated by the amount of scholarly information imported into Africa from the developed world. According to Wawire & Messah (2010) most books that are used in African Universities are authored and printed in developed countries.

A society does not become a knowledge society by merely being connected to the flow of global knowledge via technology networks. People need to be able to know how to access relevant information, how to put it to use and how to generate new knowledge that is essential to problem solving, economic growth and sustainable development. This defines also the focus of this research paper namely to develop a clearer understanding on the relationship between 'being connected' via digital technologies to the global body of knowledge (the so-called 'last mile problem') and being able to not only access relevant information but also the ability to apply it in such a manner that it will contribute to sustainable development and the creation of new knowledge. We refer to this challenge of human capacity building as the 'long mile' problem. We explore this relationship within the context of our definition of what constitutes a knowledge society and we focus our discussion on the African continent. We will argue that being connected - the so called last mile problem - will become a 'long mile problem' if connectivity does not also imply the ability of the users to put the information accessed to use and to create new knowledge. From there the title: *When the last mile becomes the longest mile: A critical reflection on Africa's ability to transform itself to become part of the global knowledge society.*

The paper is structured as follows: In the first part we explain what is meant by the so-called last mile problem and discuss, by means of appropriate examples, efforts on the African continent to successfully address this problem. We also

illustrate why it is important to be connected from an educational and human capacity perspective. Following from this we explore the so-called long mile problem – the challenge of education and human capacity building in Africa. We conclude that it is critical for African nations, if they aspire to transform themselves in becoming knowledge societies, to invest more extensively in human capacity building – not only in terms of primary and secondary education, but also at tertiary level and research and development (R & D) activities.

### To be connected: Africa's last mile problem

Traditionally, the 'last mile' is a communication phrase that has earlier been used in the telecommunications and technology industries to describe the technologies and processes used to connect an end user to a communication network (Rajakhyaksha 2009). The phrase is often used in terms of the 'last mile problem', since the final link between users and connectivity has proved to be inexplicably expensive and difficult to solve, especially in developing countries. The 'last mile' phenomenon is also applicable in the discourse on globalisation and knowledge societies because an effective and efficient information infrastructure is one of the foremost pillars for such a society (Martin 1995; Webster 2002; Britz et al 2006; Holmner 2008 and Forge *et al* 2009). Furthermore, the very notion of a knowledge society is based on ICT breakthroughs and the ability to successfully connect people to global communication networks (UNESCO 2005). For many developing countries global connectivity is still a major problem and they are still faced with the 'last mile' challenge. This connectivity challenge can have disastrous effects on capacity building and education. As ICTs are transforming education systems (Mikre 2011) so connectivity challenges will result in a "further widening of the knowledge gap and deepening of existing economic and social inequalities among the developed and the developing countries" (Tinio 2002).

Fortunately, a growing number of African countries have initiated projects to address the lack of connectivity to the internet and other global communication networks, preventing the last mile from becoming a lost mile (Holmner & Britz 2011). This is mainly as a result of a strong political will by African leaders to address this challenge and because of huge financial support over the last decade, from amongst others, the World Bank, the G8 countries, and private funding agencies (Commission for Africa Report 2005; Britz *et al.* 2006; Africa Connect 2013).

One of the most significant technological applications to have helped bridge the digital divide and address the ‘last mile’ problem in Africa is the provision of broadband. According to the Broadband Commission, broadband inclusion for everyone will signify enormous economic growth and foster socio-political development. The Broadband Commission for Digital Development was established in May 2010 as a joint venture by the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). This commission is dedicated to promoting the distribution of high-speed, high-capacity Internet in countries at every stage of development (Broadband Commission 2011). According to UNESCO (2013) broadband is a technology that carries great prospects for sustainable development through improving learning opportunities and enabling the transfer of information and increasing access to linguistically and culturally diverse content. Within developing countries there has been significant progress with regard to the accelerated deployment of broadband networks. Numerous broadband initiatives have been launched within Africa. For example, The New Partnership for Africa's Development (NEPAD) has established the NEPAD Broadband ICT Network (NBIN) initiative, which aims to ensure that most countries on the African continent have access to at least two independent international fibre cable links. This programme aims to connect all African countries to one another and, in turn, to the rest of the world through broadband fibre-optic submarine cables (NEPAD 2009).

With regards to satellite broadband connections, Nigeria was the first country in Africa to have a satellite with 4 frequency bands, which enabled the country to improve the business climate and indirectly helped in the alleviation of poverty (Adelaja & Scott 2007). The first thing that many travellers in Africa see in cities such as Kigali, Nairobi, Lagos, Dar es Salaam, Cairo, Kampala, is the proliferation of VSAT antennas on the skylines. VSAT is an acronym for Very Small Aperture Terminal, which is a two-way satellite ground station antenna with a dish antenna that is smaller than three meters. Satellite providers in Africa using this technology include AfriConnect, BlueSky, Easycom, 3DTechnologies, Bytesyste-Africa, Ipwireless, Intercel, etc. These satellite providers provide satellite Internet services to the following African countries: Tanzania, Ghana, Zambia, South Africa, Kenya, Algeria, Tunisia, Libya, Malawi, Mozambique, Cameroon, Democratic Republic of Congo, Guinea and Madagascar ([www.satsig.net](http://www.satsig.net)).

The ability of many African countries to leapfrog into mobile technology is also, from a knowledge society's perspective, significant. The continent has emerged, over a very short period of time as one of the largest users of mobile

phones. This development has fundamentally changed the way in which people communicate and live on the continent (Sullivan 2006; The Economist 2009). The many socio-economic applications of mobile technologies have also opened the digital door for many African entrepreneurs to become global role players. Mobile technologies also have a phenomenal impact on education. According to Kircos (2012) mobile technology makes learning fun, it assists students to learn more efficiently and they prefer it over traditional textbooks. One very successful initiative employing the use of mobile technology in Africa is the Worldreader initiative of David Risher. This initiative aims to supply eBooks and eBook readers to schools and communities in sub-Saharan Africa with a near-term goal of providing 1 million e-books to children in the largely English-speaking countries of Ghana, Uganda, and Kenya (www.worldreader.org 2013).

These initiatives serve as testimony that Africa is addressing, in a very profound way, the technological 'last mile'. These connectivity efforts, if successfully sustained, will not only narrow the digital divide, but can also help to reduce the continent's levels of poverty. The Broadband Commission stated recently that the digital divide continues to be a development divide that must be overcome quickly (ITU 2010). Solid progress has however been made in the construction of the digital highway and there is enough reason to be positive and optimistic about Africa's digital future and its ability to connect Africans to the global communication networks.

### Africa's 'longest mile': Developing its people

Being connected is however not enough and the last mile problem will not be solved without an investment in the intellectual capacity of the very people for whom the connectivity is being created. Human capital development forms the cornerstone of a knowledge society and is essential for sustainable development and economic growth. One can therefore state that the most valuable asset of a knowledge society is its intellectual capital. Even if the technology 'last mile' problem is overcome through the deployment of broadband networks and the availability of affordable mobile devices, the question still remains whether Africa will be able to utilise this digital highway effectively for knowledge creation and sharing, as Africa is in many respects still knowledge poor (Priti 2006; Britz 2007; Mulder 2008; Mason 2011).

Van Audenhove, in his analysis of the information society (which, for the purpose of this article can also be translated to the ‘knowledge society’) powerfully states that

one fundamental danger then of the rhetoric – and theory – of the information society is that it mainly focuses on the technical capacity of countries and sees education as a facilitator in the information society. I would argue that the central element in the information society is knowledge and that technology is merely the facilitator in development. The main focus in the development effort has in recent years dangerously shifted towards the technological to the detriment of the educational (Van Audenhove 2003:65).

This sentiment was also articulated at the World Summit on the Information Society (WSIS) in their declaration of principles, in which they recognise that education, knowledge, information and communication are at the core of human progress and also declared their vision of a people-centred, inclusive and development-oriented information society (WSIS 2003). Furthermore, education is, first and foremost, a fundamental human right, spelt out in Article 26 of the Universal Declaration of Human Rights (United Nations 1948), which declares that, “elementary education shall be free and compulsory, and that higher levels of education will be equally available on the basis of merit.”

Seen from an African perspective, the value of education was also re-iterated in 2000 by the Dakar Framework for Action, which was adopted by the World Education Forum (2000) in Dakar, Senegal. In Article 6 of this framework, education is seen as, “the key to sustainable development, peace and stability within and among countries, and thus an indispensable means for effective participation in the societies and economies of the 21<sup>st</sup> century, which are affected by rapid globalization”. Thus, education is the indispensable means for investing in human intellectual capacity and for ensuring effective participation in a global knowledge society.

This leads to the very important question: How well educated and trained are people on the African continent? According to the African Union (2009), Africa is still deficient in the utilisation of intellectual capabilities to address the continent’s own problems in a scientific manner (Commission for Africa Report 2005). Therefore there is a recognised need to make education one of Africa’s highest priorities. According to UNESCO (2011), although Sub-Saharan African countries have increased their real expenditure on education by more than 6% each year over the past decade, many countries in this region can still not provide every child with good quality primary education. According to the

report entitled, Financing Education in sub-Saharan Africa – Meeting the Challenges of Expansion, Equity and Quality, in one-third of the countries, 50% of all children do not complete primary education and 32 million children of primary school age are still out of school in the region.

The levels of literacy on the continent are also alarmingly low. According to the UNESCO Institute for Statistics (2012), although the global adult literacy rate was 84.1%, adult literacy in Sub-Saharan Africa was only 62.6%. Even though youth literacy rates in Sub-Saharan Africa are considerably higher, they are still below that of developed countries (see Table 1).

**Table 1: Adult and youth literacy rate, 2010**

Region	Adult literacy rate (%)			Youth literacy rate (%)		
	Total	Male	Female	Total	Male	Female
Arab States	74.7	83.3	65.7	89.1	92.4	85.6
Central Asia	99.5	99.6	99.4	99.7	99.6	99.8
Central and Eastern Europe	97.9	99.0	97.0	99.1	99.3	98.9
East Asia and the Pacific	94.2	96.7	91.6	98.8	98.9	98.7
Latin America and the Caribbean	91.4	92.1	90.7	97.2	97.0	97.4
North America and Western Europe	-	-	-	-	-	-
South and West Asia	62.7	74.0	51.8	80.5	86.6	74.7
Sub-Saharan Africa	62.6	71.0	54.2	71.8	76.4	66.8
World	84.1	88.6	79.7	89.6	92.2	87.1

Source: UNESCO Institute for Statistics, [Data Centre](#), April 2012

Unfortunately, this level of illiteracy creates a mirage of literacy as they are not a true measure of the intellectual ability of people to assign meaning to the information they access (United Nations 2008). What is needed is also the ability to synthesise the information. The lack of these skills, combined with the poor quality primary education, results in a lack of human intellectual capacity development in many African countries. This makes it very challenging for African countries to participate and compete as equal partners in the global knowledge economy.

Even though there is a lack of resources to fully address the education challenge in Africa, there is a strong political will and commitment towards education, particularly primary education and literacy. We list a number of these international and regional initiatives:

- The United Nations Educational, Scientific and Cultural Organization (UNESCO) created a 10-year framework of collaborative action to improve the literacy level of adults, particularly females in 35 countries world-wide.



This effort is known as the LIFE initiative (Literacy Initiative for Empowerment) (UNESCO 2006).

- The Secondary Education in Africa (SEIA) initiative of the Africa Human Development Department of the World Bank delivered 8 thematic studies on secondary education in Africa and reviewed trends in secondary education in industrialised countries. It held 3 regional conferences on secondary education and training in Africa between 2003 and 2007 (Kampala 2003, Dakar 2004 and Accra 2007). The purpose of this initiative is to promote dialogue within and between African countries and the broader international donor community on the choices available for sustainable expansion of secondary education and training systems in Africa (World Bank 2010).
- The Global Literacy Project, Inc. (GLP) is based in New Jersey and is a non-profit and tax-exempt organisation, created for the purpose of fostering community-based literacy initiatives throughout the world. The GLP initiative began in 1999-2000 with Dr Olubayi from Kenya, with the shipment of 17,000 books to Africa (GLP 2010). An integral part of their mission is the collection and distribution of books to children and community members in Africa, Asia and the Caribbean.
- The World Literacy Initiative. This is a private, non-profit, non-governmental organisation (NGO) that is situated in Atlanta, Georgia in the United States. Its primary mission is to improve literacy and basic education throughout the developing world, especially throughout sub-Saharan Africa (World Literacy Initiative 2010). The World Literacy Initiative aims to achieve this goal by making effective educational methods freely available to the people of developing nations, in particular through Evidence Based Methods of Instruction (EBMI).
- The Kusasa Project is a literacy and social skills programme that uses direct intervention with students, schools and communities to address the educational and social needs of over 1000 children in the Franschoek Valley of South Africa. ([www.thekusasaproject.org](http://www.thekusasaproject.org)).
- The International Literacy Institute, in partnership with Molteno Institute for Language and Literacy in South Africa, launched the Bridges to the Future Initiative (BFI-SA), a multimedia education programme for the promotion of literacy and other learning skills in South Africa. ([www.literacy.org](http://www.literacy.org)).

There is however still some short falls, particularly in primary and secondary education in Africa. Figure 1 below shows that there are still great disparities between regions with regards to school life expectancy. As can be seen, school life expectancy in Sub-Saharan Africa is far below the other regions (UNESCO 2012).

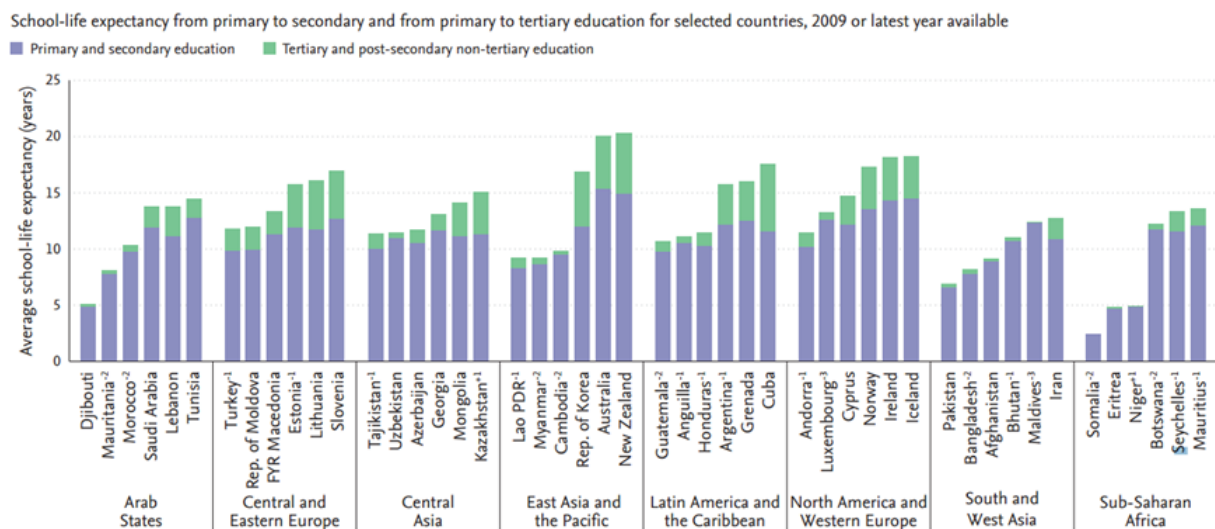


Figure 1: School-life expectancy in years by region, 1970–2008 (UNESCO 2012)

Although the sub-Saharan region still has the lowest school-life expectancy, the average number of expected school years has nearly doubled from 4.4 to 8.4 years in the period 1970 to 2008. This is a clear indication of African governments' commitment to attain the second Millennium Development Goal of universal primary education (Rosenkraz 2010; World Bank 2010).

Furthermore in sub-Saharan Africa, school fees are one of the major problems keeping children out of school. These school fees can consume nearly a quarter of an underprivileged family's income (Wright 2006). In Africa, school fees pay not only for tuition, but also include indirect fees such as community contributions, textbook fees, compulsory uniforms, etc. There have however been many success stories, and a surge in primary school enrolments in countries such as Burundi, the Democratic Republic of the Congo, Ethiopia, Ghana, Kenya, Malawi, Mozambique, Tanzania and Uganda. These African countries have abolished school fees, resulting in an increase in primary school enrolments. In Ghana, for example, primary school enrolment in the most underprivileged districts increased from 4.2 million to 5.4 million between 2004 and 2005. In Kenya, an even more dramatic increase in enrolment of primary school children was seen in 2003 with 1.2 million extra children in school. By 2004, the number had climbed to 7.2 million, of which 84 % were of primary school age (MDG Monitor 2010).

Increasing the levels of literacy and focusing only on primary and secondary education is not enough and will figuratively speaking result in Africa's longest

mile in its efforts to become a knowledge society. According to a UNESCO publication authored by Cynthia Guttman (2003) the transition to become an information society implies the raising of educational standards. This includes an increase in the number of years of compulsory education and a profound investment in tertiary education and research and development (R&D) activities. According to research done by UNESCO and the OECD (2002), countries can reap rich dividends by investing in tertiary education and R&D. Africa unfortunately lacks far behind in its ability to create new knowledge. As far back as 1998 the then Rector of the United Nations University, Hans van Ginkel commented that without a sustainable, strong knowledge sector, Africa will always remain in a dangerously dependent position (United Nations University 1998). Very few students in Africa complete tertiary education and an alarmingly high number of well-educated Africans are leaving the continent in search for better opportunities (Ekekwe 2010). In their analyses of the development of R&D in Africa the Commission for Africa made the point that although there are some excellent R&D facilities in Africa, the research capabilities are limited and that 60% of all R&D activities in Africa are centered in South Africa. The report also observed that in the greater Congo basin there is virtually “no science at all” (Commission for Africa Report, 2005:138). Furthermore, Africa as a continent lags behind the world’s other developing regions, such as South America and Southeast Asia, in total R&D spending per capita. South Africa, for example, only devotes 1% of its GDP to R&D and Egypt only spends 0.6 % of GDP on R&D (De Vré & Verde 2010).

Without proper and sustainable investment in tertiary education and R&D facilities, Africa will remain knowledge poor and will lack the ability to generate new knowledge and the goal of becoming a prosperous knowledge society will simply not be attainable.

## Conclusion

In this article we asked the question to what extent Africa can become a knowledge society characterised by global connectivity and the ability to not only utilise knowledge but also to generate new knowledge in support of sustainable development, economic growth and human wellness. We approached the question from two interrelated perspectives. The first perspective focused on the importance to connect people via communication networks to the global body of knowledge. We refer to this as the ‘last mile problem’. In the second perspective the focus fell on human capacity building

and the ability of people to not only fully utilise the information but also their ability to create new knowledge. We refer to this as the ‘longest mile problem’.

In our analysis we came to the conclusion that most African countries have made tremendous strides in the last decade to address the last mile problem. This is evident from the increase in broadband availability as well as the rapid growth in the use of mobile technologies. The major challenge in addressing the last mile problem is however the extraordinary high connectivity cost.

Even though Africa has made good progress towards global connectivity the same cannot be said about the continent’s efforts towards human capacity building. In many respects this still remains the longest mile for Africa in her efforts to become a prosperous knowledge society. Some progress has been made. The overall levels of literacy have been increased and primary and secondary education has become more accessible. There is however a lack of investment in tertiary education and with a few exceptions the R&D infrastructure is totally underdeveloped on the continent. This seriously hampers the ability to generate new knowledge – the cornerstone to any knowledge society. The last mile will remain a very long mile if African nations do not invest successfully in tertiary education and R&D facilities.

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