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Fit for the purpose? Juxtaposing global development policy discussions on knowledge-sharing with African realities

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The issue of knowledge-sharing has become more topical in global development cooperation discourse than ever before and is linked to the growing recognition of the positive growth and development effects of accentuating knowledge as a development resource. This recognition, however, follows decades of underinvestment in knowledge infrastructure as well as the prevalent policy of neglecting investments in higher education and innovation while focusing on primary education. Particularly in Africa, states have had to make severe cuts in their budgets for the science and education sectors in order to qualify for concessional loans from international financial institutions. Simultaneously, a few states and young entrepreneurs have been designing innovative solutions and using new technologies to facilitate knowledge-sharing and its application. Still, Africa's challenges in exploiting the opportunities offered by knowledge-sharing to improve its economies persist, despite promises of assistance from Africa's global development partners. This paper analyzes the state of knowledge infrastructure in African states and concludes that, in order to make these fit the purpose, massive improvements in its educational institutions are required, first and foremost.

Keywords: Africa, knowledge-sharing, education policy, ICT

Introduction

The 1999 World Development Report was among the first mainstream publications in the field of international development to recognize the organic relationship between knowledge and development. This rather belated but appropriate realization of the real nature of this relationship supported the ensuing resolve of the World Bank to upscale knowledge issues in relation to lending issues and has also helped to make knowledge a key topic in development cooperation (Akude 2014). In recent years this has led to an increased focus by policymakers and practitioners on the issue. Among the factors influencing this new increased focus and prominence is the decrease in the absolute and relative influence of official development assistance on development outcomes – as per the growing influence of other financial flows and global influences – as well as the continuing poverty challenges in middle-income

countries that are no longer dependent on external financial cooperation inputs (Haddad 2013; Keijzer et al. 2013).
The recent report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda succinctly expresses perhaps the single most important lesson learned on international development:

> Every country that has experienced sustained high growth has done so through absorbing knowledge, technology and ideas from the rest of the world, and adapting them to local conditions. (HLP 2013: 11)[1]

International development partners are increasingly positioning themselves toward more knowledge-intensive operations. The World Bank is further consolidating its position in this area through its "Science of Delivery" and knowledge-sharing priorities (World Bank 2011). The topic of knowledge-sharing, moreover, was prominently featured in the October 2013 meetings of the Global Partnership on Effective Development Cooperation as well as its recent 2014 High-Level Meeting in Mexico City (MC 2014).

This recognition stands in stark contrast to decades of underinvestment in knowledge systems and the tendency to move away from investments in higher education and innovation toward a focus on primary education – as was promoted initially by the structural adjustment programs (SAPs), and later by international development policy frameworks such as the Millennium Development Goals (MDGs). This has particularly been the case in many African countries. During the 1980s and 1990s, many of them had to make severe budget cuts in their education and science sectors in order to be eligible for concessional loans offered by their international partners. But despite increased levels of investment in recent years, they still have much catching up to do (World Bank 2010). Development cooperation practice has, moreover, frequently belied the endogenous nature of knowledge for development by promoting expert- and supply-led approaches to capacity development support (Keijzer 2013). This nature of the offered knowledge interventions may account for the lack of identification with – and application of those kinds of knowledge in most African societies (Akude 2014).

This article analyses the state of knowledge infrastructure in African states on the basis of a review of the scholarly literature and empirical evidence from various sectors and countries. Its first section establishes the congruence of knowledge and development and relates it to the analysis of the policy discussions on the roles of knowledge-sharing in international cooperation. The second section underlines the effects of neglecting higher education in the process of implementing SAPs and the MDGs. In light of the effects of this neglect, section three questions the readiness of African states to exploit the enormous opportunities offered by the application of knowledge to development and explores the extent to which the expressed desires reflect the realities and challenges of Africa. Section four subsequently synthesizes the main conclusions and implications of the article, based around the principal observation that a

massive improvement in Africa's educational institutions is needed to enable it to transform its economies as well as to help it benefit from available international assistance.

Knowledge, development and policy discussions on their relationship

The question of what actually constitutes knowledge is mired in controversy.[2] However, most of the definitions given relate knowledge to action, expertise and experience while observing that facts, data, information and wisdom are components of knowledge (cf. Akude 2014). As early as 369 BC, the Greek philosopher Plato defined it as "true belief with an account," only to subsequently admit that this definition is inadequate. Relatively recently, Liebowitz and Wilcox (1997) offer a more comprehensive definition that stresses the contextual component of knowledge. This definition sees knowledge as the entire set of insights, experiences and procedures that are considered correct and true, and therefore guide the thoughts, behavior and communication of people. That is, lessons drawn from our experiences condition us to know. There have also been controversial discussions on the abovementioned components of knowledge relating mainly to their manner of interaction (see Akude 2014 for details).

This article opens with a statement that sees knowledge and development as being organically bound. Wherein lies this bond? The bond between knowledge and development lies in the fact that, if we consider knowledge as the entire set of insights, experiences and procedures that guide our thoughts and actions, development is the improvement recorded in the process of applying those insights, thoughts and actions in solving the problems of human existence. Since this often happens in a cooperative process, learning and development are, by their very nature, contextually bound social enterprises. Looking at knowledge and development from this perspective brings into question the relevance of knowledge transfers as well as the efficaciousness of donated development.

Nonetheless, donors and development organizations that have embraced the necessity of knowledge for development purposes within the prevalent mode of donated development have sought to improve their performance by learning from the outcomes of their development interventions and integrating those lessons into the creation of new policies, that is, knowledge management. Thus, the concept of knowledge management for development has been growing with the recognition of the necessity to apply knowledge to development. There is no internationally accepted definition of knowledge management. This article applies the definition as put forward by Ferguson et al. (2008: 8), who define the concept as involving "processes and practices concerned with the use of knowledge, skills and expertise within the development field." This definition reflects an evolved understanding of managing knowledge for development, which different studies observe as having generally shifted from a technology-centric to a people-centric approach, thus reflecting an epistemological shift from an objectivist to a practice-based perspective (Ferguson et al. 2008: 13). Mansell (2010: 6) similarly observes a shift in emphasis from exogenous to endogenous technological change.

Still, most recent findings show that knowledge management takes place at the intersection of people, processes and technology, as effective knowledge management demands the interaction of these three (Akude 2014).

Due to the preclusion of the logic of good governance in the development trajectory of postcolonial African states (Akude 2008), a majority of African states have a tradition of being in sync with the zeitgeist of international development. Thus, ever since the donors' recognition of the relevance of knowledge for development, there has been no shortage of political statements and declarations adopted by African leaders that acknowledge the priority of promoting more knowledge-oriented African economies.[3] One example is the information and communication technology (ICT) framework of the New Partnership for African Development, which argues:

> [T]he goals of achieving a Common Market and an African Union can benefit immensely from the revolution in information technology. In addition to fostering intra-regional trade, the use of ICTs could also accelerate Africa's integration into the global economy. Intensive use of ICTs can bring unprecedented comparative advantages to the continent. (UNECA 2005: 2)

Notwithstanding these and many other declarations, African governments' investments in promoting knowledge-based economies have been both uneven and disappointing. Indeed, this disappointment is not restricted to investments for promoting knowledge-based economies but extends to all themes of political and economic development in postcolonial Africa. Akude (2008) explains that wrong policy choices are the bane of development in Africa and that these wrong policy choices can be traced to the preclusion of the imperatives of good governance in the historical trajectory of the emergence of modern African states. These imperatives include: the state's exigency to secure its borders and unite citizens in order to avoid foreign aggression; the state's exigency to guarantee its own existence through taxation; the exigency of sourcing a state's finances through elastic economic bases as compared to inelastic ones; the separation of those who wield economic power from those who hold political power; as well as a strong desire to escape Western (and other forms of) domination. The unavailability of these factors in postcolonial Africa precluded the emergence of the logic of good governance that disposes states to govern well: provision of security for all citizens; increasing tax opportunities by providing infrastructure for health and education; due legal processes; a stable private sector, etc. In the absence of this logic, development was largely neglected by African rulers, thereby entrenching the economic weaknesses of African states and making way for development cooperation – with its flaws – to become unduly dominant in most African states.

Effects of structural adjustment programs on higher education in Africa

Having established the relevance of development cooperation for African states as well as the relevance of knowledge promotion as part of that cooperation, it is thus pertinent to inquire about the infrastructural and capacity readiness of African states to be part of the development knowledge bandwagon. This is particularly relevant in view of the effects of SAPs in Africa. These deleterious effects have been further exacerbated through the implementation of the MDGs.

Development cooperation has not been beneficial for African states, as African rulers often tend to implement programs that hurt economic development, for example SAPs, which were introduced by international financial institutions to imbue African economies with the capability to repay loans they accumulated over the years. One major policy recommendation of SAPs that had deleterious effects on education generally in Africa – and higher education in particular – was the substantial reduction in public spending. Coupled with the traditional low regard for education in African political affairs (exemplified by low funding), this recommendation led to a considerable reduction in education financing in Africa. A comparison between SAP recipients and non-SAP recipients showed that the former group recorded more drastic decreases in public education investment as a percentage of GDP (Reimers 1997). Furthermore, between 1980 (the year in which most African states began implementing SAPs) and 1990, there was a 31% reduction in higher education spending in Africa on average (Reimers 1997: 5). More recent studies show that development cooperation preferences have, in recent years, also stimulated disinvestment in higher education in sub-Saharan Africa, which, between 1990 and 2006, invested 0.8% of its GDP in education (with the OECD average being 1.21%). At the individual student level, this creates a stark contrast:

> [W]hereas public spending on education per student doubled in non-African developing countries between 1990 and 2006, in Africa it declined overall, from about $2,900 to $2,000 per student. The decline was fastest in higher education [HE]. This reflects the increase in HE student numbers as well as a shift in resources to primary and secondary education, consistent with the Millennium Development Goals. (Lawton et al. 2013: 44)

Furthermore, in a review of nine Poverty Reduction Strategy Papers from African states, six explicitly planned budget cuts for tertiary education (cf. Awiti 2012). African donors equally neglect higher education. For example, at US$ 600 million a year, funding for higher education from international development cooperation is a paltry 25% of all international aid to the education sector (UNESCO in Awiti 2012). Prof. Peter Maason of the University of Oslo (in Gibbon 2010) attributes this neglect of higher education in Africa to the fact that development aid is generally directed to areas that the donors consider priorities. These

include the fight against HIV and AIDS, poverty alleviation, primary healthcare, food security, etc.; unfortunately, higher education is not one of the priorities.

UNESCO uses enrollment in higher education institutions as a proxy (among others) for investment in higher education. Its report in 2009 shows that gross enrollment in African higher institutions is the lowest globally, at just 5%, whereas it is 11% in India, 20% in China and 70% in OECD countries (UNESCO in Awiti 2012). Chronic underinvestment in education has precipitated further declines in the quality of higher education in Africa, exemplified by incapable graduates and a dearth of scientific and technological innovations. Consequently, innovative technological development in Africa takes place outside the walls of Africa's higher institutions, as exemplified by several innovations in ICT (which is a sharp contrast to other parts of the world). Africa's peer reviewed research contributes only 0.7% of global intellectual output (Awiti 2012). Thus, the Chancellor of Great Lakes University, Prof. David Wasawo, was right to describe higher education in Africa as being in shambles (Awiti 2012).

Part of the research for this article was visiting a few academic institutions that one of the authors of this article either knew or attended in Nigeria in the 1980s and comparing their present state with the past. What he saw could simply be described as pathetic: dilapidated buildings with destroyed roofs and broken windows, collapsed walls, flooded fields (that used to be football fields), etc., not to mention the devastating dearth of good lecturers – because lecturers are poorly and often irregularly paid, the good ones leave. The solution of Nigerian society to this problem has been the emergence of private institutions of higher learning, which are exorbitantly priced and can only be afforded by the financially well-to-do.

Declining investment in higher education in Africa has further consequences for Africa's development, chief among which is the low quality of education: most university graduates cannot demonstrate the capabilities that their certificates attribute to them. Other consequences include very low salaries; lack of academic infrastructure such as books and computers, including computer literacy; and poor living and working conditions in institutes of higher learning. These factors have influenced the brain-drain from Africa. Thus, Africa has been losing the best minds at just the time it needs them most. Another consequence of this development is the extremely low quality of civil and public service in many African states, worsening the already poor quality of governance.

Moreover – mainly resulting from the obliteration of the logic of good governance in the trajectory of the emergence of postcolonial African states – there is no strong social consensus on the importance of higher education. If there was, African rulers would have discerned the relevance of knowledge for development and linked higher education to technological and economic growth, and thus placed knowledge and innovation at the center of national

development. Such a social consensus or pact is a key condition for universities to be able to play their role in development, as argued by Gibbon (2010).[4]

Indeed, on the prodding by the donor communities, African states have started recognizing the necessity of knowledge for development. But their words have not been matched by actions, as there are disparities between declared policies and policy actions:

> In Tanzania, the concept of knowledge economy features in some national development policies, but there is a complete absence of mechanisms to steer higher education towards development. In Uganda, on the other hand, the position is almost completely reversed: the notion of a knowledge economy is not mentioned in the national policies, but features strongly in Makerere University's strategic plan and research policy. (Cloete in Gibbon 2010)[5]

The most balanced position on this issue can be found in Rwanda, where the government has declared its intention to pursue a knowledge economy and is doing everything possible to realize this. In 2008, Rwanda unveiled its national development program, named Vision 2020, in which the government expressed the desire to turn the Rwandan economy from an agriculture-based to a knowledge-based economy. Within the frameworks of this program, it launched a one-laptop-per-child scheme, in which 200,000 laptops were distributed to pupils in 400 schools in 2008. In 2013, it signed a deal with Korean Telecom to provide 4G technology at a cost of US$ 140 million. Between 2009 and 2013, there were 3,000 kilometers of fiber optic constructed, in addition to the building of telecenters and telepoints all over the country to create better access to ICTs (Mbele 2013). To help support the acquisition of information and computer literacy, the government signed a 10-year contract with Carnegie Melon University in the United States, which led to the opening of a campus in Kigali. The university is to provide graduate degree programs in information technology and computer and electrical engineering (Raghavan 2014). In Nigeria, there is neither a declaration for nor concrete policy measures toward a knowledge economy.

Traditional development cooperation has since recognized the problem of poor levels of funding for education in Africa and has been trying to tackle it by funding research programs. However, the discrepancies between donor priorities and the needs of African states discussed above have hindered the success of development aid in this area. Furthermore:

> [P]rojects funded by development aid can weaken the academic core by drawing away academic capacity, reducing academic output, and contributing to the neglect of research. The structure of many projects places them at periphery of institutions where the best outcome is the development of largely isolated pockets of excellence, and the worst is that projects become unsustainable and die when funding dries up, with no lasting legacy for the institution. (Maason in Gibbon 2010: 1)

Thus, the gap between research and innovation remains.

This trend of declining public investment in higher education means that user payment is becoming the norm in developing countries, and that students are becoming more engaged in online education (Lawton et al. 2013), similar to the abovementioned emergence of private schools for higher education in Nigeria. However, in many developing countries, students have increasing levels of access to subsidy schemes, with most growth coming from schemes being provided by emerging economies such as India and China. During the India-Africa summit in 2012, India's prime minister, for instance, promised to provide 10,000 scholarships to African students and said that this number was expected to increase to 22,000 within 10 years (Yaruingam 2013). Other studies also favor China's focus on higher-education support over the MDG approach, which prioritizes primary education and does not promote knowledge-based economies but instead merely supports "a level of development that prevents slippage into underdevelopment" (Chan in Lawton et al. 2013: 47). Although such external investments are welcome, it should be emphasized that the state is still largely responsible for fostering an enabling environment and absorption capacity through investment in education and social policy (Kamara et al. 2007; UNDP 2013).

Undermining the promotion of higher education – coupled with the lack of well-coordinated declarations and policy activities on this issue – has led to a situation whereby African societies cannot exploit the enormous promises offered by the phenomenon of knowledge and ICT for development. This notwithstanding, due to technological progress, the investment gap in transmission infrastructure has been "leap-frogged" by mobile telephone solutions (i.e., no fixed-grid needed). This has led to a situation in which countries such as Kenya and Somalia have advanced further in mobile banking than some OECD members. Despite this, African states still have gaps to fill. Infrastructure gaps, however, remain an important bottleneck, such as the inability of African governments to provide adequate and reliable electric power supply[6]; and a lot of Africans are still excluded from the use of ICTs. This points to an important role for the state in facilitating the transition to knowledge-based economies, and emphasizes the link between the nature and quality of governance: "inefficiencies brought about by flawed governance, like those of inadequate infrastructure and other factors are losses to society as a whole" (Swart 2011: 9).[7] The 2013 Human Development Report similarly identifies determined social policy innovation – with a strong emphasis on education and social organization – as one of three main drivers behind the rise of the global South. It summed up the key challenge facing many sub-Saharan states as follows: "host countries need to invest in the capacity of their people to identify and use the knowledge embedded in foreign capital and ideas (UNDP 2013: 49).

Implications for more knowledge-intensive development cooperation with Africa

The overall picture emerging from this discussion on policies and strategies is a diverse one, depicting a mixture of policy declarations without concrete policies; concrete policies without policy declarations; declarations matched with concrete policies; and neither policy declarations nor concrete policies. Moreover, many African states are still donor-dependent on the issue of policy declarations as well as concrete activities in the area of knowledge for development. Nonetheless, there are important exceptions to be found in several African countries that suggest this can be done differently. We hope that these may inspire other African countries to follow suit.

Furthermore, we know that states that frame their economies as knowledge economies and develop policies to pursue such declarations have been utterly successful in the recent past (cf. Akude 2014). The African private sector offers some success stories in applying knowledge and information technology to development. These developments have implications for development cooperation.

1. Due to the proven cases of success for states that framed their economies as knowledge economies, it has become pertinent for development cooperation to convince African states to frame their economies similarly. The fact that Rwanda – despite not having natural resources – has been the fastest-growing economy in the last couple of years should be instructive here. Knowledge has to be put at the top of the development cooperation agenda! Doing this presents challenges for development cooperation with African states at three levels: micro, meso and macro. Equally important is the design of programs that do justice to the three and do not just focus on one or two, as the case has been till now.
2. The micro dimension refers to the improvement of human capacity to learn, retain, update and use knowledge. Although classical development cooperation with Africa has always included issues relating to education, accentuating knowledge for development has increased the relevance and urgency of development work in this area. The application of ICTs has revolutionized learning methods so much so that even educated people have problems coping with these changes. Therefore, continuing education and on-the-job trainings have become more relevant for employees to help facilitate their adaptation to these changes. For the less-educated – and even uneducated – Africans, the problem is even more acute. Although some donor development cooperation ministries and agencies have some specific programs that deal with this, they are elitist and have very few participants.
3. The meso dimension focuses on individual development organizations, ministries and agencies with the purpose of steadily improving their knowledge management. There is no denying the fact that good knowledge management has the potential to improve the work of development organizations. Consequently, those organizations should try to optimize

their knowledge-sharing policies and activities. This could imply improvements in knowledge management systems in the classical areas of development cooperation, namely project implementation, capacity-building, etc. The prevalent idea of development cooperation with Africa – in which the donors know it all and the Africans know hardly anything – should also be jettisoned within this purview. Rather, development experts from the West should initially try to understand the problems of African societies from the perspective of Africans before thinking about how to apply their academic knowledge. This implies further that the method of coming to Africa with solution templates designed in the West should be stopped forthwith.

4. The macro dimension focuses on the accentuation of knowledge for development cooperation with African states. Compared to development cooperation as currently practiced, this is a somewhat novel and radical approach. For example (and continuing the thought train that ended the last paragraph), instead of sending experts to Africa, development cooperation with Africa should emphasize cooperation in the generation and use of knowledge for development, facilitated by the now available ICTs. This way, global development will help African countries to groom their own experts, who will be better suited to tackle problems of poverty because they bring a local approach to the solutions. This suggestion could have far-reaching implications for development cooperation.
5. Global development cooperation should mainly fund knowledge-mainstreaming and sharing. African states should be encouraged to transform their economies into knowledge economies while taking cognizance of the realities of their factor endowment. For the donor states, development cooperation should be extended beyond the classical institutions to include academic institutions. Ministries and agencies in donor societies should encourage and fund cooperation between their academic institutions and those of the African states so that both reap the advantages of the mutual fertilization of ideas. Thus, knowledge cooperation will then be arranged according to the principle of comparative advantage: donor states should focus on areas where they are comparatively better than others.
6. This further implies that the intensive regulation of development cooperation, as demanded by the Paris Declaration, will have to be reversed as a natural consequence of fundamentally reducing development cooperation to knowledge cooperation. Result-oriented controls of development cooperation with African states become irrelevant if they develop the capacity to run the projects. This way, development cooperation will be promoting self-reliance and self-control – this is actually what development is all about.
7. With self-reliant development and a higher level of self-control of development projects, one of the purposes of the Paris Declaration of 2005 – namely, the ownership of development processes by the recipient states – can be realized. The joint production of development knowledge will take the knowledge of developing societies into account, and projects that arise from that collaboration will equally emphasize the capabilities of African states. Thus, the hitherto exclusion of African citizens from the development

projects being implemented solely by Northern experts in their societies (which, among other things, led to the issue of ownership in the first place) will automatically disappear.

8. This approach of focusing on knowledge cooperation will definitely alter our understanding of development; and rightly so. This is justified by the observation that our understanding of development influences our development cooperation and subsequently constitutes the basis for judging the efficaciousness of development projects. In the last 60 years, our understanding of development has been shifting from economic growth and structural modernization through social development, satisfaction of basic needs, freedom and expansion of choice to sustainable development, and back again to growth, and then to fighting poverty, which is defined as living below US$1 a day. As a result of the confusion surrounding the meaning of development, most authors have preferred to abstain from defining it. However, none of these understandings capture the very essence of development because they are all basically relative. Development is so fundamental to human societies that it cannot be relative. Every human society is in a constant state of development, sometimes for better and sometimes for worse. We thus need an understanding of development that is absolute and is applicable to even the "most primitive" of all human societies. Thus, development is here considered to refer to improvements recorded by human societies as a result of applying lessons learned in the process of using their immediate (and distant) biological and physical environments to solve problems of human existence. This definition offers some advantages over prior definitions of development, chief among which is that it emphasizes learning by doing and thereby accentuates the organic relationship between development and knowledge. It further underlines the context-specificity of development processes. Consequently, knowledge produced in concert with researchers who are not only deeply aware but are also part of the social context that is being researched upon should be more promising in solving problems of development that are in their very nature embedded in African contexts.[8]

Conclusion

Knowledge is intrinsically bound, as development cannot take place without knowledge. Global development cooperation sidetracked this issue for too long. However, since the introduction of the relevance of knowledge to development and cooperation, it has become a hot topic. Consequently, African states and their donor partners have jointly declared their intentions of utilizing the opportunities offered by this development to improve the economies of African states. However, only a few African states have clearly formulated policies that are matched with activities to realize these declarations. The lack of imperatives for good governance in the development trajectory of modern African states predisposed African rulers to undermine the pursuit of economic development in their societies while busying

themselves with stealing public funds and hiding them in foreign banks. The consequence is the deepening of poverty and underdevelopment, the intensification of the relevance of development cooperation with donor states as well as the neglect of education. Neglecting economic development has led to the accumulation of debts to international financial institutions, which then introduced SAPs to jump-start African economies to help them repay the loans. The implementation of SAPs – coupled with the introduction of the MDGs – combined to destroy the African knowledge infrastructure.

Consequently, the state of knowledge infrastructure in Africa is not conducive for the successful implementation of a knowledge-based economy. To correct this situation, African states do not necessarily need to invest in ambitious projects. Rather, they need to concentrate on the provisioning of essential basics and strengthening of the education systems to create a foundation for knowledge production, dissemination, use and sharing that eventually create a basis for implementing the declared policies. This will provide infrastructural support to the enterprising spirits of African geniuses and thus contribute toward economic transformation. It is believed that if African states and their donor partners implement most of the recommendations in this piece, poverty and underdevelopment will soon be a thing of the past in Africa.

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1 This is supported by many studies that conclude that countries with strong and sustainable growth patterns are characterized by deliberate "learning by doing" strategies (see, for instance, UNDP 2013; Whitfield 2012)
2 See Akude (2014) for an exhaustive discussion on the definition of knowledge.
3 For illustration, please refer to this collection of ICT policies adopted by African states; available online: http://www.ist-africa.org/home/default.asp?page=ictpolicies (accessed 14 Jun 2014).
4 Trish Gibbon is the Director of Academic Planning and Policy Implementation at the University of Johannesburg, South Africa.
5 Nico Cloete is Director of the Center for Higher Education Transformation in Cape Town, South Africa. The Center conducted a study called Higher Education Research and Advocacy Network in 2010.
6 Grosskurth (2010: 46) presents some sobering statistics to illustrate the depth of the challenge: "A typical Google data centre requires a reliable electricity supply of 30 MW. In 2009, the country of Rwanda with its 10.5 million inhabitants had a maximum power supply of 69 MW, including 30 MW of leased diesel generators, rendering the idea of establishing a data centre an impossibility." He however notes that smaller server functions would nonetheless already provide strong benefits.
7 This interesting blog post compares Kenya's and Rwanda's strengths and weaknesses in relation to their ambition to become Africa's Silicon Valley, and concludes that many challenges here are governance-related; available online: http://brel54.blogspot.nl/2013/03/striving-to-become-africas-first.html (accessed 2 March 2014).
8 This is not to insinuate that external contexts do not have influence on local contexts in the process of development. Definitely, they do! However, the extent and direction of their influence is often determined by local contexts.