Higher Education and Globalization

Challenges, Threats and Opportunities for Africa

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We dedicate this book to our colleague and friend,
the late Professor Brij Kishore Baguant from the University of Mauritius
who inspired us with his wisdom and cheered us with his incisive wit.
Preface

The unprecedented changes in the means of generating, delivering, accessing and disseminating knowledge and information are having far-reaching impacts, direct and indirect, on higher education systems worldwide. For universities in sub-Saharan Africa, where management and administrative capacities are already limited, responding to these changes in the global knowledge system is particularly difficult. The challenge for them is to develop institutional strategies that take into account the ongoing globalization of knowledge, assess existing ways of working and chart a new course for the future. For most African universities this is by no means a simple exercise.

Over the last two years, we have been engaged in the complex but exciting task of facilitating and assisting African universities to develop strategic plans not only to counter the impacts of globalization, but also to benefit from the opportunities it presents. The project invited university leaders, including vice-chancellors, rectors and their advisors, from eight African countries – all members of the African, Caribbean and Pacific (ACP) group of states – to assess the challenges, risks, potentials and opportunities facing African higher education institutions as they negotiate the powerful forces of globalization. The African participants represented the University of Kisangani (Democratic Republic of Congo), the University of Cape Coast (Ghana), Moi University (Kenya), the University of Malawi, the University of Mauritius, the Catholic University of Mozambique, the University of Dar-es-Salaam (Tanzania) and Makerere University (Uganda).

Prior to the process of developing their strategy papers, the university leaders selected a team of eight experts on higher education in Africa to assist them. The participants and the experts then attended a three-day workshop in Maastricht, the Netherlands, in May 2009, where they discussed the many issues involved. Following that dialogue, the university leaders then developed first drafts of their strategies, which were reviewed and commented on by the other participants and the team of experts.

A year later, in April 2010, at a second seminar in Mangochi, Malawi, the participating university leaders presented their final strategy papers. They discussed what they had learned from their own and each others’ experiences, and from the experts. Details of the process and the methods used during the exercise are presented in the Annex to this volume, in the hope that others will learn from this experience.

Different institutions and countries are of course affected by and respond to the forces of globalization in a variety of ways. Thus strategic approaches for harnessing the potential of small island states such as Mauritius, for example, are likely to be different from those chosen by equally small but landlocked countries such as
Malawi. Larger countries such as Ghana and Kenya could benefit enormously from strategies that aim to deploy and engage their intellectual diasporas in revitalizing their higher education institutions. The Democratic Republic of Congo, with its vast natural resources, might utilize global and regional knowledge networks to turn these assets into value-added products that would generate significant economic benefits.

The strategy papers developed by the leaders of the eight universities take into account their countries’ diverse economic, historical, educational, social and political dimensions both to develop and to strengthen the capabilities needed to create and disseminate knowledge, and thus to increase their competitiveness in the global knowledge marketplace. The strategy development exercise provided opportunities for the participants to learn from each other, and also to review critically their own objectives, programmes and activities.

The initiative was launched with four outputs in mind – papers by the six experts, eight strategy papers, a joint action plan and this publication – and was made possible through the financial assistance of the European Union via the EduLink programme, which is implemented by the ACP Secretariat in Brussels, Belgium. The project was managed by the Maastricht University Centre for International Cooperation in Academic Development (MUNDO), the Netherlands, in collaboration with the eight African universities, and the University of Antwerp, Belgium. The experts’ papers have been published in this book. The university strategy papers as well as the action plans can be downloaded from the MUNDO website.

The overarching objective of the initiative has been to enhance the capacity of African universities to develop strategies that will deliver graduates equipped to tap global knowledge resources and adapt and apply what they have learned in support of local and regional development. In supporting the eight participating universities to develop their strategies, it is our hope that the underlying insights, the available evidence and the emerging expertise for well informed strategic decision making will help them anticipate, manage, explore and exploit the processes of globalization. We trust that this book will also be useful to other universities engaged in the process of deciding on their own strategy papers.

**Damtew Teferra and Heinz Greijn**
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**Notes**

1. EduLink ACP–EU Cooperation Programme in Higher Education: www.acp-edulink.eu
Acknowledgements

Making this book has been an interesting journey during which we tremendously enjoyed the company of the university leaders, their advisors and the team of experts whose names are listed on page 107. We thank them for inspiring us with their ideas and experiences.

We would like to thank Cecilia Costa and Michael Mueller of the EduLink Programme Management Unit for their advice and support. Our special thanks go to Professor Leonard Kamwanja and his colleagues for their hospitality and for organizing the seminar in Malawi. Special thanks also go to Hennie Sijen, Sjoerd Kusters, Dennis Ernes and Jan Ploum of MUNDO for their dedicated support to this project, and to Valerie Jones for her tireless efforts to make our texts presentable.
Introduction: Globalization and African higher education

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In the first decade of the 21st century, the unprecedented advances in information and communications technologies (ICTs) have led to an explosion in the volume of knowledge, information and data that can be delivered and accessed instantaneously. In parallel with the emergence of the ‘information society’, the phenomenon of globalization has led to increased cross-border trade and business, and massive movements of people across borders and even continents. While the subject of globalization is often contentious, its impacts are undoubtedly profound and complex in scope. In this book, the contributors discuss the significance and extent of the impacts of globalization in relation to higher education systems in Africa, in particular their capacities to create and disseminate knowledge.

African higher education systems are perhaps the most marginalized in the world, and yet the most internationalized in their form, dimensions and scope (Teferra, 2008). Most of the knowledge created and developed worldwide originates in the North, and Africa consumes it almost entirely. The languages of instruction, curricula and research also emanate largely from the North; no African country has yet successfully managed to change this situation. Virtually all the books, journals and monographs used in African institutions are still published in the North. The major publishers and distributors – whether commercial companies such as Palgrave Macmillan or Routledge, or university presses such as Oxford or Harvard – are based in the North, and their academic and business interests lie with their constituencies in the North.

We are all now dependent on global information, media and business conglomerates not only for day-to-day communication and commercial activities, but also for research,
teaching and learning. It is now difficult to think of a world without search engines, for instance. Africa remains the least important but probably the most affected region of the global village as it depends on these companies and their products without having a visible stake in their development or ownership.

With a host of poorly developed knowledge systems, Africa is having to deal with globalization not from a position of strength, but from one enmeshed in weaknesses that have arisen from the confluence of many factors – historical, economic, educational, financial and paradigmatic. That makes it all the more difficult and more complicated for African countries to address the challenges of globalization, while at the same time making strategic plans and designing initiatives to tap their enormous potential.

THE INITIATIVE

For any nation, global competitiveness and economic success now depend on the existence of capacities to create, develop, consume, package and disseminate knowledge. The advances in ICTs and the explosion of knowledge, information and data are such that the already rough ground between the North and the South has become even more uneven. But these ‘fluid’ resources also offer a wide range of opportunities that African countries could use to alleviate this unhealthy imbalance and foster economic development in general.

Part of the aim of the initiative that made this book possible is assisting higher education institutions in Africa to develop appropriate strategies aimed at enhancing their capacities to confront the challenges and threats of globalization. At the same time, universities need to strengthen and consolidate their potential in areas such as teaching, research, scholarship and innovation, to ensure that they deliver graduates equipped to tap global knowledge resources and apply what they have learned in support of local and regional development.

Developing an institutional strategy that captures past experiences, analyzes existing ways of working and charts a course for the future is by no means a simple exercise. For most African universities, where management and administrative capabilities are already limited, coupled with the fast-changing dynamics of higher education, developing a thorough and meaningful institutional strategy is even more difficult. In recognition of these complex institutional issues, in 2008, the partners in this project, including eight African and two European universities launched the project, ‘African Universities Develop Strategies Addressing the Challenges of Globalization’. This project was funded by the European Union via the EduLink programme, which is implemented by the ACP Secretariat in Brussels. The project was coordinated by the Maastricht University Centre for International Cooperation in Academic Development (MUNDO).
INTRODUCTION: GLOBALIZATION AND AFRICAN HIGHER EDUCATION

This book is a collection of articles prepared by the experts who assisted the leaders of eight African universities in developing their strategy papers. The experts presented draft versions of their chapters at a seminar at the University of Maastricht in April 2009, and revised them in response to the comments of the participants, peer reviewers (drawn from the team of experts) and the editors.

In the opening chapter, Han Aarts and Heinz Greijn of MUNDO explore the dynamics of knowledge in the global context, and in developing countries in general. They observe that policy making in the area of knowledge for development is still in its infancy, and usually does not go beyond the common notion that knowledge is good and leads to more development. From the perspective of developing countries, particularly in Africa, the expansion of the body of global knowledge is not following a well laid out strategic path; as the volume of available knowledge has mushroomed, it has also become highly fragmented. The main challenge has become how to train knowledge workers to identify and connect to useful sources of knowledge and mobilize them for development. So far, most efforts have tended to focus on developing research and teaching capacities within rather ‘traditional’ bricks-and-mortar institutions. Aarts and Greijn propose more appropriate and relevant changes in light of the ongoing transformation in the knowledge domain.

In the first of the expert contributions, Fred Hayward observes that postgraduate studies are, in many respects, hostage to the expansion of undergraduate training far beyond the human and physical capacities of most tertiary education institutions in Africa. Based on information from 16 African countries, he acknowledges some promising developments in graduate education, but notes that the overall state of postgraduate training is not particularly good, and the recent economic crisis is unlikely to help. He identifies some pockets of strength, especially in South Africa, and acknowledges the growth in the number of innovative and creative postgraduate programmes that have been introduced in recent years. However, Hayward believes that universities face substantial challenges in expanding their graduate programmes and improving the quality of research in the region.

Olusola Oyewole then describes the pillars of the knowledge economy and the role of universities in the knowledge and innovation system. He too discusses the challenges facing higher education institutions in Africa that prevent them from contributing to the knowledge economy. Among these are limited funding, the brain drain, poor working and living environments, poor leadership and governance, HIV/AIDS and globalization. To help overcome these challenges and constraints, Oyewole offers a number of strategic options that African universities could consider in their efforts to promote knowledge production, access and dissemination. These include, among others, mobilizing the political leadership, concentrating on developing a few strategic disciplines, and developing appropriate institutional
policies aimed at improving national knowledge infrastructures and innovation systems.

With the emergence of the knowledge economy, it is increasingly recognized that higher education and research can play a crucial role in reducing poverty and helping to achieve sustainable human development. In recent years, several steps have been taken to create the conditions that will allow African countries to move from commodity-based to knowledge-based economies. Juma Shabani believes that regional and international cooperation can play a vital role in the process of knowledge generation and dissemination. He explores various examples of academic and research collaboration in higher education in Africa, all of which form parts of larger efforts to enhance the higher education sector in particular, and regional development in general.

Information and communication technologies (ICTs) have greatly accelerated the pace of globalization. They have increased global trade and productivity, facilitated business and industry expansion, and enhanced education and research collaboration. Based on case studies in eight countries, Anna Bon assesses the opportunities for improving access to ICTs in African higher education. Although Africa is catching up in some respects, such as mobile telephony, Bon identifies many political, financial and structural challenges, both internal and external, that are hampering the implementation of ICTs in sub-Saharan Africa, and the direct implications for education. She notes that the tertiary education sector is the most important stakeholder in ICT development and needs to be actively involved in national dialogues on the implementation and use of technologies. Through their active participation in national and international networks, tertiary education institutions can increase their influence on and control of these developments. She concludes that speeding up the process of implementing ICTs in tertiary education must be given high political and institutional priority, not only for their direct benefits in the short term, but especially for their indirect medium- and long-term influence on society as a whole.

Higher education in Africa has seen considerable expansion in the last decade. Nephas Mufutumari discusses the role of distance education, and the growing trend towards collaboration with partner universities in Europe and North America. He argues that international cooperation can benefit local programmes by helping to improve the quality of courses, and by offering accreditation as well as financial, information and technological resources. He then examines the implications of distance education for research, the quality of programmes and the recognition of qualifications.

Africa’s intellectual diaspora represents a tremendous but so far underutilized resource, says Damtew Teferra. Some efforts have been made to tap the economic, financial and intellectual capital of diaspora communities overseas, but so far most have
not been successful. However, a number of new national, regional and international initiatives are now in place to encourage highly qualified intellectuals to contribute to the development of their home countries. Their potential to contribute to higher education, research and innovation is evident from the impressive numbers of African professionals and academics employed around the world. These migrants could become a powerful force in linking their host institutions with the often marginal institutions in their home countries, by transferring new technologies and helping to bridge the knowledge divide. Teferra explores the potential benefits of engaging the diaspora, as well as the challenges and risks that constrain its full deployment.

The Annex presents an evaluation of the project conducted by Daniel Nciyiyana.

DEVELOPING GLOBALIZATION STRATEGIES FOR UNIVERSITIES: LESSONS LEARNED

It is clear that the African institutions involved in this initiative operate in diverse socio-economic, political and educational contexts. Accordingly, their capacities to tap into global sources of knowledge and to produce high-calibre graduates will develop at different rates and will follow different paths. Despite these differences, by the end of the seminar in Malawi, the participants agreed on a number of priority issues that must, in one way or another, feature in all their strategies.

ICT infrastructure

With the spread of ICTs, space and distance have become relative concepts. Learning processes are increasingly dependent on ICTs because they connect students and researchers to the global knowledge community. In a globalized world, it is unthinkable that a higher education institute could become a centre of excellence without a reliable and up-to-date ICT infrastructure. Any university’s strategy for the future must include ways to acquire this infrastructure and ensure that it is used in the most efficient and effective ways.

Innovative systems for teaching and learning

For students everywhere, advances in ICTs have brought about fundamental changes in the ways in which they learn. Whereas in the past students acquired the knowledge they needed from printed books and journals in libraries and in lectures delivered in university buildings, they can now log into virtual libraries, surf the internet, use virtual spaces for collaboration and group work, enrol in e-learning courses, and participate in online networks that can span the globe. Learning has become an interactive and collective exercise in cyberspace, and in the process the relations between students and teachers have changed. ICTs have accelerated the erosion of the image of lecturers as being close to omniscient. How to prepare students to tap into and connect to the global knowledge economy is now much more than a technical
issue. It requires a paradigm shift in thinking about teaching and learning. Teaching today is less about transferring knowledge and more about facilitating a learning process, and it requires teachers who are able to use different methods of instruction. Measures that will encourage innovative methods of teaching and learning have to be part of any university’s globalization strategy.

**Research capacity**
Research is often the weakest and most neglected component of higher education in Africa. Yet, networks of researchers have emerged as crucial vehicles for acquiring knowledge from global sources, enhancing understanding of global phenomena and developing solutions to local problems. Research is key if Africa is to make significant and recognized contributions to regional and global knowledge, and thus to attract students, researchers and resources. Developing a meaningful and comprehensive research capacity must therefore be a core element of any university’s globalization strategy.

**Leadership, management and quality assurance**
Promoting ICTs, encouraging innovative approaches to teaching and learning, and strengthening research capacities are essential components of any university’s strategic response to globalization. But in order to implement these effectively, universities will need strong leadership, management and the commitment to establish and maintain quality standards.

African institutions sorely need highly trained staff who can recognize the opportunities offered by technological innovations, and who know how to turn them into improved solutions for teaching and learning. Yet, too often, ICT innovations are expected to come from the technicians working at the bottom of the hierarchy. The idea that universities might need a chief information officer who is in a position to influence policy making at the highest level is not yet widely shared.

The introduction of innovative systems for teaching and learning will require academic curricula and methods of assessment involving a more integrated approach to the various disciplines. For this to happen, management will need to coordinate the process of interdepartmental collaboration, and to demonstrate the firm leadership needed to overcome the resistance to change that can invariably become a major obstacle to a successful outcome.

Improving research capacities at African universities will require more than just additional funds. In countries where research funding is provided by foreign agencies, and is often scarce, the most common result is the fragmentation of research efforts. University leaders and management need to be determined to use their scarce resources to develop coherent research agendas, if possible in partnership with other institutions in the region or overseas.
Change has to be for the better. Quality assurance mechanisms will need to be put in place to monitor and evaluate whether, and if so to what extent, the ICTs, innovative approaches to teaching and learning, and enhanced research capacities actually generate improved learning outcomes.
Globalization, knowledge and learning: Developing the capacities of higher education institutes

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The process of globalization is changing the ways in which knowledge is produced, applied and disseminated. This chapter focuses on the consequences of these changes for education, research and innovation. Universities, the most important institutions in the organization of research and higher education, need to rethink their roles and functions, and develop their capacities to anticipate and respond to these challenges.¹

There is growing recognition that knowledge is the main driver of development. Any form of development, whether defined in social, human or economic terms, has become critically dependent on knowledge. Countries with the capacity to generate and assimilate knowledge, and the capability to use it to develop new forms of organization, products and services are better able to attract investors and to take advantage of new opportunities (Szirmai, 2008). Moreover, this applies not only to industrialized countries, but also to countries whose economies depend on the availability of cheap labour and the production of commodities. The capacity to assimilate knowledge is acknowledged as a key factor that will enable developing countries to catch up economically and otherwise (World Bank, 2009).

By the same token, our globalizing society is also becoming increasingly and critically dependent on knowledge for addressing problems and challenges at all levels. At the global level, knowledge is needed to predict and to mitigate the impacts of climate change and global warming, which will affect developing countries in particular. These effects may be global (rising sea levels), regional (more frequent floods in certain areas) or local (requiring changes in agricultural production methods). At the national level, health authorities need to know how to run a
functioning health system that provides at least basic standards of public health and medical care, and ensures the efficient use of public and private organizations, institutions and resources. At the local level, farmers need knowledge of innovative agricultural technologies to enable them to cultivate their land without contributing to erosion and other forms of environmental degradation.

Meanwhile, the production of knowledge is growing at an amazing pace, most of it concentrated in what used to be called the ‘North’ or the ‘Western’ world, but increasingly also in the newly industrialized countries in Asia and Latin America.2

While it is true that due to advances in information and communication technologies (ICTs) the growing global knowledge pool is becoming easier to access, it is equally true that geographic proximity still matters. Innovation and development studies have shown that processes of knowledge production and use have become more complex, to the extent that only large conglomerates of knowledge producers and users interacting intensively with each other are able to generate the critical mass required for further advancement. Not surprisingly, most of these conglomerates, or knowledge hubs or hotspots, are found in the North. The contributions of researchers in the developing world to global knowledge production have so far been relatively small. Most of Africa and large parts of Asia and Latin America are far remote from the world’s knowledge hotspots.

From the perspective of developing countries, the expansion of the body of global knowledge is not following a well laid out strategic path; as the volume of available knowledge has mushroomed, it has also become highly fragmented. The main challenge has become how to find the right sources of knowledge and to mobilize that knowledge for development. This task is enormously complex, especially for developing countries. Policy making on knowledge for development is still in its infancy and in many cases does not go far beyond the common notion that knowledge is good and leads to more development3, without providing much in the way of ideas on how this should work in practice.

TOWARDS A GLOBAL RESEARCH FOR DEVELOPMENT AGENDA

This lopsided global knowledge and innovation system, with its centre of gravity in the industrialized world, is likely to change, however. In a recent essay, Luc Soete4 described the emergence of a global research for development agenda that is relevant for both the developing as well as the ‘developed’ world (Soete, 2009; Molenaar et al., 2009). This new agenda will trigger the development of new research activities, often initiated by international partnerships and consortia, and may lead to new research hotspots in emerging and even developing countries.

In Soete’s view, the whole process of innovation – using existing knowledge and generating new knowledge that is relevant to development – is changing rapidly. In many
cases, innovations are no longer based on the discovery of new technologies, but rather on the ability to exploit new combinations of existing knowledge in specific contexts. In today’s increasingly complex environments, innovations become based on trial and error, leading to unique, context-specific solutions that may be difficult to replicate elsewhere. There are many examples, ranging from management problems in large (Western-based) institutions such as banks, hospitals or industry, to the development of low-tech water management systems in the coastal areas of Bangladesh or in the Sahel countries.

Such fundamental changes in the application of knowledge have important implications. Almost every innovation becomes unique with respect to its application. Endogenous innovation processes will move to center stage in both rich and developing countries. Innovation needs to take place close to the users’ context and to involve them in the innovation process. Prahalad (2004) recognized the enormous potential in the developing world for innovations and products that will be developed, produced, sold and used mainly by poor communities at the ‘bottom of the pyramid’. One example is M-Pesa, a money transfer service developed in Kenya, which allows subscribers to transfer money by mobile phone from one side of the country to the other within seconds, without having to queue for hours at a bank. Because of the sheer magnitude of the world’s poor communities and the urgency of the many problems they face, a strong expansion of research capacity in and for the developing world may be expected, if not a shift of global innovation capacity ‘Southward’. Thus endogenous innovation capacities in the developing world could contribute directly to development and to the development of knowledge in general.

Soete admits, however, that this more balanced distribution of knowledge hotspots across the world may not evolve without support. Most developing countries have a very poor knowledge infrastructure and lack even the rudimentary structures needed to enable ‘bottom of the pyramid’ types of development to happen. So far, in terms of knowledge production and output, the gap between Africa and other poor regions, and the more advanced regions seems, if anything, to be widening. In other words, poor countries need a lot of support in developing appropriate policies and strategies, in terms of funding, technical assistance and international cooperation.

In supporting the evolution of endogenous innovation capacity, a number of issues need to be considered.

• As historical experience in the North has shown, sufficient knowledge and innovation capacity will by no means guarantee that innovation efforts will be targeted at real development problems.

• Innovation in the South is not about copying the North, but about tapping knowledge from global sources and using it to develop solutions that are appropriate to specific local contexts (contextualization) (Saint, 2003).

• In view of the rapid advances in ICTs, it is possible that in the not-so-distant future, developing countries will be able to access global knowledge much
faster than the developed countries ever could. Geographic distance to global knowledge hubs, as well as legal and commercial obstacles, still limit access to knowledge, but it is likely that these problems will gradually be overcome.

- The processes of generating innovations and applying knowledge may be rather different from the 'laboratory-led R&D' innovations that have been the dominant drivers of economic and technological development so far (Soete, 2009).
- Supporting the knowledge and innovation systems in developing countries is complicated by the increasing international mobility of 'knowledge workers' – researchers, students and experts. Although mobility offers opportunities for individuals, it has resulted in the loss of many skilled workers – known as the brain drain – from most poor countries (see Teferra, 2000, 2003; Mohamedbhai, 2003). Recent surveys suggest that there are more African researchers working overseas than within Africa itself (e.g. Mohamedbhai, 2005). Although the brain drain continues to be a serious problem, and everything should be done to stem this one-sided outflow, it has become clear that it cannot be stopped or even substantially slowed as long as global imbalances continue to exist. The massive movement of educated people needs to be accepted as a reality. Taking that as starting point, there may be opportunities to stimulate 'brain circulation', the (temporary) movement of knowledge workers based in the North to contribute to knowledge development in and for poorer regions. In particular, African diasporas based in the North could play a role that has not been effectively explored so far (see the chapter by Damtew Teferra, page 83). Knowledge institutions in the North may also encourage their academic staff to contribute to development in the South, both on an individual basis and as part of partnerships with institutions in the South.

**RESEARCH REVISITED**

The changes in the global knowledge and innovation system have far-reaching consequences for the world of research. Researchers need to be able to relate to more actors and to access a wide variety of funding sources. Research funding by governments and other public agents is increasingly allocated on a competitive basis, which may well intensify the fragmentation of knowledge rather than synergy among research activities. Research is increasingly conducted through collaboration in global networks in which the geographically concentrated knowledge hotspots play a central role.

For researchers in developed and developing countries the emphasis is shifting away from research in rather isolated settings to participation in global knowledge networks. The challenge is to connect to and effectively tap existing global knowledge bases, and to build up the capacities that will be needed to translate and adapt it to local contexts (Saint, 2003). Stiglitz (1999) summed up this process in one
catchy phrase: ‘Scan globally – reinvent locally.’? Researchers need to learn how to participate effectively in and use such networks. Those in developing countries are at a disadvantage because internet access in their countries is frequently limited or unreliable. They are already on the wrong side of the digital divide, and are struggling hard not to end up on the wrong side of the global knowledge divide.

Apart from gaining access to knowledge via the internet, researchers need to develop the skills to extract and to critically verify knowledge through such networks. And they will have to ‘reinvent’ how to contextualize and apply that knowledge in often poor and resource-scarce communities and environments in order to produce innovations and applications that are meaningful from the perspective of human development. Partnerships with researchers and knowledge institutions in the North may be instrumental in enabling their participation in global knowledge networks. Ideally, such partnerships will foster mutual learning about how to develop and apply knowledge in new ways in support of human development.

**HIGHER EDUCATION REVISITED**

The changes in knowledge and innovation systems from the ‘small’ to the global level will also have implications for the way knowledge workers are trained.

In a ‘small’ world with limited connections to the wider world, knowledge development and innovation tend to be driven by local actors, pursuing local opportunities, addressing local challenges and using the knowledge that is available locally. In such a system, it is still possible to look at knowledge as a set of domains of limited size that can be adequately covered in textbooks and syllabuses. Lecturers are appreciated for having mastered this knowledge and for transferring it to students through traditional lecture-based teaching methods. This approach to education has been widely criticized, however.

Change is needed, in favour of more student-centred approaches based on active learning whereby students acquire the same level of cognitive skills as in traditional teaching, but in a way that the relevance of the knowledge is evident. As long as the sharing of knowledge was still largely constrained by the limited physical mobility of brains and books, the image of teachers as holders of knowledge vis-à-vis receptive students could last. Advances in ICTs are accelerating the erosion of this image. As the vast resources of ‘global’ knowledge come within the reach of each and every student, lecturers will no longer be appreciated primarily for being ‘knowers’, but for being (re-)searchers with a passion to find answers to questions, to formulate solutions to problems, and to able to transfer their curiosity and skills to the search for insights and solutions rather than to produce codified knowledge.

With vast knowledge resources at their fingertips, students need to learn in rather different ways than they do at present. The traditional basis of education – students
amassing information through rote learning just because it may be useful sometime – is becoming less important. This needs to be replaced by developing the student’s capacity to learn as and when the need arises depending on the issues and problems they have to address. In other words, students no longer need to learn to work from a (more or less static) knowledge base, but how to work with the knowledge that they collect and interpret independently.

Students thus need to be trained how to process knowledge independently. As future knowledge workers, they will need to work mainly on their own initiative. In the global knowledge society, they will need to behave as ‘self-directed learners’. In the complex reality of the global economy there are no instructions and little routine, and often even the issues and problems are not clear. So students also need to learn how to identify issues and problems that are relevant and meaningful in their area of knowledge and expertise. They must learn how to analyze issues, to identify what knowledge they need, and how to find it. They also need to know how to validate the information they find and how to distinguish science-based knowledge from opinions and ideas – another increasingly complex problem, especially on the web.

Last, but not least, students must be able to contextualize the knowledge and apply it to the issue or problem that needs to be solved. This is possibly the hardest part, and in this sense globalization is a risk because learning and knowledge development may become increasingly disconnected from the society in which the university is situated. There are business schools operating in Africa with no local research capacity that fly in lecturers from Europe, North America and Asia, where tuition fees can be pretty steep. Chances are that these MBA students will become very familiar with the intricacies of the business strategies of companies such as Cisco Systems, but with no understanding of the challenges facing the shopkeeper or garage owner around the corner. There is no question that Africa needs knowledge workers and policy makers who have learned how to tap into global knowledge networks. But it is equally important that they are able to play an active role in using and adapting the knowledge they acquire for local development.

The success of higher education institutes in Africa will be determined by the extent to which their graduates are able to tap knowledge from global knowledge networks and apply it effectively to their own contexts in support of local development. The question then is how to organize education in such a way that learning globally contributes to the capacity to address needs locally.

There are several ways in which universities can ensure that students acquire the ability to contextualize global knowledge. One is to develop graduate programmes that are complemented by strong research programmes with a local focus and which are run by creative and passionate researchers who can inspire students. Another way is to adopt project- or problem-based learning and similar methods that encourage
students to be curious and creative in solving problems that are very similar to those they will encounter in practice in their future careers.

Unfortunately, all of this is far from the current reality in most parts of the (developing) world. Higher education institutes need to thoroughly rethink how students are instructed and how they learn. The urgency of this has been recognized and confirmed in recent policy papers, such as the World Bank’s report on tertiary education in sub-Saharan Africa (World Bank, 2008).

CONSEQUENCES FOR CAPACITY DEVELOPMENT

The situation outlined above obviously has many implications for efforts to develop capacities in higher education and scientific research in Africa. So far, most of these efforts have tended to focus on capacities for research and education in rather traditional ways. Here, ‘traditional’ means a focus on developing capacity to do research as a somehow ‘academic exercise’, usually emphasizing sound research methodologies and often with few links to societal contexts. Yet, as noted by Taylor (and other observers), ‘there is a growing need to question the paradigms of knowledge and innovation that inform the research carried out in various contexts’. This is also the case for ‘the relationship between research carried out by [higher education] institutions and its application in wider society; and the way that society and human development needs shape the research agenda’ (Taylor, 2008).

In education, capacity development efforts have focused on rather traditional campus- or classroom-based (if not lecture-based) teaching, with an emphasis on theoretical content, rather than on applied content that has development relevance and uses innovative methodologies. In a way, this is very understandable. With low bandwidths and limited access to computers still the norm in Africa, the confinements of space are still very real. As explained above, such isolation contributes to lecturers being valued first as sources of knowledge and only later for their ability to inspire and challenge the students’ academic curiosity.

Against this backdrop, it is understandable that the bulk of resources for higher education in Africa are still invested in traditional universities with libraries and lecture halls, as they have evolved over the centuries in the industrialized world. But the ICT infrastructures in developing countries are improving, with consequences for the ways in which education is organized. While investing in the African universities of the future, it is important to anticipate these changes. Saint, for example, sees a new role for university libraries as ‘interactive information resource centres for the university and the surrounding community, providing both traditional and computer-based learning materials. They will merge gradually into electronically linked regional and global knowledge webs’ (Saint, 2003). But to become a reality, this will require major changes on the part of universities themselves. For a start,
they will need to understand that the traditional library must evolve to become a full partner in the academic enterprise. Yet if the library is indeed transformed into a state-of-the-art learning resource centre, it may well be that this will eventually require a complete revision of the organization of the entire university.

In the near future, it is not unlikely that many, if not most, educational programmes, either residential or offered as distance learning courses, will consist of a combination of lectures, e-learning coursework, practical skills training and group work, with ICTs as indispensable tools throughout. This will be a revolution not just in educational formats, but will also require a thorough revision of what are considered effective ways of teaching, the introduction of state-of-the-art methodologies and new approaches to learning.

The global knowledge economy, made possible through the rapid advances in ICTs, has many implications for higher education in the developing world. If universities and other institutes are to take full advantage of new opportunities, they will need to rethink the current strategies for improving their capacities for teaching and research.

Notes
1 This chapter is partly based on a paper presented at the CERES Summer School on Education and International Development: Exploring the Research–Policy Nexus, Radboud University, Nijmegen, the Netherlands, July 2009.
2 Due to the lack of a definition that satisfactorily includes the greatest divides between countries (e.g. developed vs. developing, advanced vs. backward, rich vs. poor, industrialized vs. rural, etc.), here we use the North–South division, which is in many ways also incorrect.
3 Various studies (e.g. Bijker, 2006) have questioned the direct relationship between knowledge production, innovation and economic growth, implying that while there is indeed a relation, it is a highly complex one.
4 Luc Soete is director of the United Nations University–Maastricht Economic Research Institute on Innovation and Technology (UNU–MERIT).
5 For many years, one of the main problems in higher education in the developing world has been the rather uncritical copying of curricula developed in the North, which often are barely meaningful or relevant in the context of developing countries.
6 ‘Most knowledge produced globally is not produced where its application is most needed. The challenge is how to transfer knowledge that may have been produced anywhere in the world to places where it can be used in a particular problem-solving context. Because Africa is not presently well equipped to participate in the global knowledge economy, developing the organizational and electronic capacity to identify, access and adapt external knowledge for local problem-solving will produce developmental dividends’ (Saint, 2003).
Which, by the way, is a perfectly legitimate way in itself to generate new, ‘localized’ knowledge. ‘Every alleged example of local implementation of central policy, if it results in significant social transformation, is in fact a process of local social discovery’ (Donald Schön, cited by Stiglitz, 1999).

In an adaptation from a paper of Patrinos (2002), a recent MUNDO brochure claims: ‘The emergence of the global knowledge-based society implies that we have to move from: terminal education TO lifelong learning; knowledge-based learning TO application of knowledge; discipline-based knowledge TO integrated (multidisciplinary) knowledge; rote learning TO analysis, synthesis, understanding; learning things just in case they may be useful TO just in time learning; directive-based learning TO initiative based learning; and individual study TO group (team) work’.

Cisco Systems is a US-based multinational specializing in communications technology and services.

Perhaps the most difficult task facing tertiary institutions as they transition to a culture favoring innovation is to change their traditional pedagogy. The changes required are well known: interdisciplinary rather than disciplinary perspectives; flexibility in learning; group work instead of lectures; problem solving rather than memorization of facts; practical learning as a complement to theory; learning assessment through project work that demonstrates competence instead of multiple-choice examinations; communication skills and computer literacy’ (World Bank, 2008).

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Knowledge has become the chief currency of the modern age. The ability to generate and exploit knowledge is essential in the creation of wealth. But African countries face considerable challenges in generating, accessing and disseminating knowledge. Higher education has been identified as crucial for social and economic development, in which African countries must invest. This chapter identifies the pillars of a modern knowledge economy, discusses the challenges facing many African countries and offers recommendations on the strategic choices that need to be made by the various stakeholders.

The accumulation and application of knowledge have become major factors in economic development and are increasingly at the core of a country’s competitive advantage in the global economy (Salmi, 2003). Knowledge can contribute to social and economic development in numerous ways:

- driving competitiveness and productivity;
- facilitating improvements in welfare and environmental stewardship;
- improving nutrition, combating epidemics and protecting against natural disasters;
- encouraging better institutions and governance – it is recognized that there is a clear correlation between low educational levels and the occurrence of civil strife or ethnic conflict;
- providing crucial inputs for policy-making processes; and
- reshaping economies.

The capacity to use knowledge effectively allows nations, communities, individuals and enterprises to utilize their resources and improve their well-being, thereby contributing to development. The World Bank (2007b) noted that ‘simple exposure to knowledge, while necessary, does not ensure its effective use. One must be able to select the right form of knowledge, master its application, adapt it to specific circumstances, keep up with changes and make improvements’. This fact has made it necessary to recognize that there are situations where knowledge may be available but cannot be employed,
because of the lack of capacity to transform and apply it. The actors involved may not have the necessary authority, capacity or material resources to change reality. This has led to the concept of ‘enabling knowledge’, which is the capacity to take actions that can alter or effect new realities, based on the knowledge that has been acquired.

A knowledge economy requires a significant number of highly educated people. The major challenges for the African continent are to recognize and support the pillars of a versatile knowledge economy, and to develop the machineries necessary for knowledge creation, knowledge access and knowledge dissemination.

According to the Task Force on Higher Education and Society, higher education institutes have an important contribution to make: ‘Without more and better higher education, developing countries will find it increasingly difficult to benefit from the global knowledge-based economy’ (World Bank, 2000: 9). The report indicates that ‘the quality of knowledge generated within higher education institutions and its availability to the wider economy, is becoming increasingly critical to national competitiveness’. Further, Bloom et al. (2003) provide evidence to show the positive impact that tertiary education and knowledge can have on economic growth and poverty reduction in sub-Saharan Africa.

**PILLARS OF THE KNOWLEDGE ECONOMY**

A knowledge economy relies on knowledge as the key engine of economic growth. It is an economy in which knowledge is acquired, created, disseminated and applied to enhance economic development. For a knowledge-based development process, the following conditions are necessary.

**Education**

Education is the fundamental driver of the knowledge economy. A well-educated and skilled labour force is essential for creating, sharing, disseminating and using knowledge effectively. Education is expected to build up an educated labour force, where people are able to continuously upgrade and adapt their skills to create and use knowledge efficiently. All subsectors of the education system – primary, secondary, tertiary and lifelong learning – need to work in harmony to drive a knowledge-based economy.

Higher education does not just build people; it also builds economies and provides templates, paradigms and strategies for human development. The contributions of higher education to the socio-political, economic and educational life of a nation and to individuals are presented in Table 1. Throughout history, the availability of knowledge has determined whether people and nations will be rich or poor, succeed or fail, overcome or be overcome themselves. A lack of education, especially appropriate education, partly accounts for the conflicts, distrust and confusion in many parts of the world.
Table 1. Benefits of education to the nation and individuals.

<table>
<thead>
<tr>
<th>Economic</th>
<th>The nation</th>
<th>Individuals</th>
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<tr>
<td></td>
<td>• Economic growth</td>
<td>• Better jobs, with higher salaries and benefits such as pensions</td>
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<td></td>
<td>• Poverty reduction</td>
<td>• Higher savings levels</td>
</tr>
<tr>
<td></td>
<td>• Sustained income growth</td>
<td>• Better working conditions</td>
</tr>
<tr>
<td></td>
<td>• Shift to knowledge-based economy</td>
<td>• Improved job satisfaction</td>
</tr>
<tr>
<td></td>
<td>• Research and innovation systems</td>
<td>• Professional mobility</td>
</tr>
<tr>
<td></td>
<td>• Foreign direct investment</td>
<td>• Reduced reliance on financial support from the government</td>
</tr>
<tr>
<td></td>
<td>• Employee productivity</td>
<td>• Increased career prospects</td>
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<td></td>
<td>• Increased tax revenues</td>
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<td></td>
<td>• Increased consumption</td>
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<td></td>
<td>• Increased labour flexibility</td>
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<td></td>
<td>• Entrepreneurship</td>
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<tr>
<td>Social / political</td>
<td>• Reduced crime</td>
<td>• Improved health and life expectancy</td>
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<td></td>
<td>• Increased community engagement</td>
<td>• Improved quality of life</td>
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<tr>
<td></td>
<td>• Improved civil society</td>
<td>• Enhanced opportunities for social mobility</td>
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<tr>
<td></td>
<td>• Social cohesion</td>
<td>• Better decision making</td>
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<tr>
<td></td>
<td>• Increased open-mindedness and tolerance</td>
<td>• Improved personal social status</td>
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<tr>
<td></td>
<td>• Building and maintaining democratic values</td>
<td>• Improved leisure time</td>
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<tr>
<td></td>
<td>• Improved ability for societal change</td>
<td>• Development of individual capabilities and potential</td>
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<tr>
<td></td>
<td>• Building distinct national and globally connected identities</td>
<td>• Problem-solving based on reasoned arguments and discourse</td>
</tr>
<tr>
<td></td>
<td>• Shift to a knowledge-based society</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Informed criticism, debate and dialogue</td>
<td></td>
</tr>
<tr>
<td>Academic / educational</td>
<td>• More better-qualified teachers for the education system</td>
<td>• Building up of the total person</td>
</tr>
<tr>
<td></td>
<td>• More avenues for research in the education system</td>
<td>• Opportunities for lifelong learning</td>
</tr>
<tr>
<td></td>
<td>• More international in outlook</td>
<td>• Fulfilment of destiny and role in society</td>
</tr>
<tr>
<td></td>
<td>• Ability to survive the challenges of globalization</td>
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Today, there are over 300 higher education institutions in Africa, with 6.2 million students (Materu, 2007). Within the past ten years, Africa has witnessed rapid growth in the number of private and distance learning tertiary institutions. This is partly because existing public institutions can no longer cope with the increasing population and the growing demand for education. Nevertheless, Africa’s gross enrolment in tertiary education is just 5%, compared with 70% in North America and 24% in Europe.

**Information and communication technologies**

A modern and adequate infrastructure for information and communication technologies (ICTs) includes telephone, television and radio networks and, above all, access to the internet. The information structure is expected to facilitate the effective communication, processing and dissemination of information, consequently enhancing the knowledge domain. Within the past few years, there have been tremendous improvements in ICTs in Africa but, as Anna Bon shows in her chapter, page 59, there is still a lot that needs to be done. The availability of ICTs to higher education institutions has implications for their ability to generate knowledge.

**An effective innovation system**

An effective innovation system is one that is able to keep up with new knowledge and technologies, tap into the growing stock of global knowledge and assimilate and adapt it to local needs. A nation’s innovation system includes firms, research centres, universities, consultants and other knowledge-based resource persons. The innovation system is measured by parameters such as the number of researchers engaged in research and development (R&D) per million inhabitants, the number of patent applications granted and the number of scientific and technical journal articles published. Table 2 provides a regional comparison of some of these parameters.

Africa’s long-term publication output trends indicate that its contribution to global knowledge production has slipped slightly since the 1990s (Tijssen, 2007). Africa as a whole has lost 11% of its share of global science since its peak in 1987, while sub-Saharan African science has lost almost a third (31%). Overall, the citation impact scores are significantly below the worldwide average, indicating the limited visibility and impact of African science.

Research in Africa faces many challenges. Sub-Saharan African countries spend less than 0.3% of their GNP on research on average – the lowest level in the world. Africa’s share of global scientific output fell from 0.5% in the mid-1980s to 0.3% in the mid-1990s. Furthermore, Africa has the lowest ratio of researchers per million inhabitants in the world. Africa, which is home to 12% of the world’s population, accounts for less than 1.5% of research publications annually (Oyewole, 2006). When measured by the number of researchers per million inhabitants, Africa’s knowledge-generation capacity is the lowest in the world (see Table 3). The number of academic
qualifications and the level of graduate training are some of the indicators that can be used to measure the potential ability of institutions to generate knowledge.

Generally, the level of postgraduate training is low in many African universities. Staff–student ratios are also very high, meaning that most academics spend much of their time teaching, to the detriment of research that will generate knowledge. The percentage of academics with higher degrees is generally low in most universities. These factors have implications for the ability of universities to serve as knowledge generation hubs for their countries and regions (Fred Hayward discusses graduate education and research elsewhere in this volume).

**Governance and policy support**
This includes the country’s institutional regimes, trade regulations and policies, as well as the rule of law, all of which encourage the efficient mobilization and allocation of resources, stimulate entrepreneurship and encourage the creation,
dissemination and effective use of knowledge. The institutional and governance regimes are expected to provide good economic policies and institutions that permit the efficient mobilization and allocation of resources, stimulate creativity and provide incentives for the dissemination and use of existing knowledge.

**CHALLENGES**

Higher education institutions in Africa face numerous challenges, which are currently hindering their contribution to the knowledge domain. These include limited funding, leadership and governance, the brain drain, poor working and living environments, HIV/AIDS and globalization, as discussed in the following.

**Funding**

On average, sub-Saharan African countries spend less than 0.3% of their GNP on research – the lowest level of research funding in the world. As a result, many researchers suffer from poor working environments, low pay and a lack of equipment and career prospects. These factors damage morale among African researchers and encourage people to migrate to industrialized nations.

**Research policy**

Few universities in Africa have well-defined research policies or adequate research management structures. The research funds that are available in some universities are not judiciously allocated.

**Conducive environment**

Working and living environments that are conducive to research in Africa are rare. Instability in many countries affects their ability to generate knowledge. There is a need to ensure good governance and autonomy.

**Knowledge management skills**

There is a dearth of people with the appropriate skills for the management of research and knowledge in Africa. Many researchers still find it difficult to compete for research grants. Capacity-building programmes are needed to improve the research and knowledge management skills among university leaders.

**Collaboration**

Collaboration and networking among the players in the knowledge domain is low. Efforts are needed to promote interactions between researchers within Africa and those in the rest of the world. Special promotional avenues should be developed for popularizing research outcomes in Africa.
Knowledge dissemination

Knowledge dissemination is difficult in Africa because many researchers find it difficult to publish their work in international journals. Publishers have little interest in accepting articles that focus on local issues, which limits the dissemination of research outcomes from the continent.

Globalization

Globalization is an emerging challenge for higher education in Africa. One of its most visible manifestations has been the emergence of the ‘borderless’ higher education market, in which universities in developed countries promote their services in Africa. These new players include for-profit private universities, corporate ‘universities’, media companies delivering educational programmes and professional associations, and the capacity to regulate them is limited. Globalization has also made academics more mobile, prompting the migration of skilled labour and fostering the brain drain.

PLAYERS

The major players in the production, accessibility and dissemination of knowledge in Africa include higher education institutions, national governments and others, such as non-governmental organizations.

Higher education institutions

More than any other players, higher education institutions are primarily responsible for knowledge production, access and dissemination, for the benefit of their nation and the world. Kearney (2009: 11) notes that the research conducted within academia remains a prime source of knowledge and innovation at national, regional and international levels.

Strong institutional leadership is required for African universities to become committed to relevant and innovative knowledge production, acquisition and dissemination. This includes offering a bold vision of the institution’s mission and goals, with clearly articulated strategic plans that can translate the vision into concrete targets and programmes (Salmi, 2009). African universities also need to improve their graduate training programmes and allocate more funds to research.

Singh and Manuh (2007: 12) corroborate this, noting that African higher education institutions should respond to the challenges of the emerging knowledge economy ‘through all key core function areas of teaching, research and community engagements, through the development of new curricula and qualifications to address new educational and training needs, through developing appropriate research themes to address new knowledge needs and by forging new partnerships

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and joint ventures with industry, small- and medium-sized enterprises, government departments, community organizations and other stakeholders.

In order to address the challenges of globalization, and in particular the globalization of knowledge, African higher education institutions will need to:

- incorporate knowledge production, access and dissemination into their institutional vision and mission;
- develop strategic plans to improve knowledge generation, access and dissemination;
- provide effective and committed leadership, with a transparent and focused administration;
- promote innovation in their teaching, research and community services;
- provide infrastructural, financial and human capacity support for knowledge generation, access and utilization;
- create institutional units and centres to improve the management of research and innovation; and
- promote capacity building for knowledge managers within institutions.

**National governments**

Governments play crucial roles in shaping the policy directions that determine the ability of their countries to access or disseminate knowledge. National governments are essential for developing policy frameworks, and for financing the creation of environments in which knowledge can thrive.

Other key players include regional and national research institutes and centres, continental and international NGOs and other development partners, regional knowledge-based associations, research networks, publishers and other media, and the private sector.

**STRATEGIC IMPLICATIONS**

Clearly, Africa is lagging behind in knowledge generation and is not benefiting from the opportunities created by the knowledge economy. Many writers have emphasized that Africa needs to develop appropriate strategies to catch up with the rest of the world (Hassan, 2001; Sachs, 2005). However, there is a need to develop appropriate strategies for promoting knowledge and the knowledge economy in Africa.

The following recommendations are intended to help African countries overcome the challenges and constraints that are currently hindering knowledge and the knowledge economy and to help raise levels of knowledge production, access and dissemination in the region. In order to promote knowledge generation and utilization in Africa, a number of appropriate strategic options could be considered (see Table 4). These include:
Mobilizing governments
The political leaders of African nations must recognize the need to support knowledge in their various countries. This could be done through the African Union Commission. Governments should be encouraged to devote more funds to education at all levels and to research, as well as to increase their expenditures on tertiary education as a means to build up a knowledge economy.

Knowledge infrastructure
Funds allocated to education should be used to improve the quality and the extent of the knowledge infrastructure in each country. In order to strengthen competitiveness, there is a need to concentrate on developing some strategic disciplines, such as computer

<table>
<thead>
<tr>
<th>Issues and challenges</th>
<th>Strategic options</th>
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<tbody>
<tr>
<td>Poor funding for research that will generate knowledge</td>
<td>• Mobilizing leadership to commit funds to research and higher education</td>
</tr>
<tr>
<td>Lack of effective policies to promote research</td>
<td>• Creating better integrated policies that will highlight the strategic contributions of knowledge to economic development</td>
</tr>
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<td></td>
<td>• Developing national policies and programmes that will strengthen the four pillars of the knowledge economy (education, innovation, ICTs, governance)</td>
</tr>
<tr>
<td>Lack of effective capacities at the institutional level for research and knowledge management</td>
<td>• Assisting higher education institutions to strengthen their research and knowledge management capacities</td>
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<td></td>
<td>• Promoting innovation and research at local and regional levels</td>
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<tr>
<td>Lack of environments that are conducive to knowledge generation</td>
<td>• Providing enabling environments that will promote peace and allow knowledge to thrive</td>
</tr>
<tr>
<td></td>
<td>• Encouraging strategic monitoring and evaluation of research and challenges to research in various countries</td>
</tr>
<tr>
<td>Lack of collaboration among knowledge workers</td>
<td>• Creating linkages among knowledge workers across Africa and beyond</td>
</tr>
<tr>
<td>Lack of knowledge management skills</td>
<td>• Introducing education reforms to respond to the demands of the knowledge economy</td>
</tr>
<tr>
<td>Information gap</td>
<td>• Mobilizing innovation and research at local and regional levels</td>
</tr>
<tr>
<td></td>
<td>• Facilitating advocacy and the promotion of knowledge</td>
</tr>
<tr>
<td>Lack of avenues for disseminating knowledge</td>
<td>• Encouraging the production and distribution of information in African journals, bulletins and newspapers</td>
</tr>
<tr>
<td></td>
<td>• Offering free or cheap access to computers and the internet</td>
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literacy, information technology and entrepreneurial, interpersonal and self-marketing skills. This could be achieved through open or virtual universities and distance education.

**Policies and reforms**
Appropriate national and institutional policies on innovation and knowledge should be developed, together with government reforms to reduce the loss of trained knowledge resources through the brain drain. Special policies that facilitate innovation, networking, collaboration, graduate training and research should be put in place.

**Capacity building**
If universities and other higher education institutions in Africa are to contribute to the global knowledge economy, they need to strengthen their institutional and human resources capacities. Specifically, they will need to set up internal bodies or R&D centres for coordinating research, and provide appropriate professional training for their staff to enable them to manage knowledge-based projects.

**Advocacy**
Within each African country, national advocacy campaigns could promote education, research and innovation. Such campaigns could include regular, appropriate efforts to publicize research needs and achievements. One important initiative that could be emulated is the National University Research Fair of the National University Commission in Nigeria, where universities inform the public of their research achievements. Researchers should become more vocal spokespersons for their work, and learn how to lobby their parliaments to promote their cause among decision makers and politicians.

**Networking and collaboration**
Knowledge workers should be encouraged to collaborate and work together. Collaboration among researchers within Africa is currently low. Improving the intra-African mobility of researchers and students would facilitate knowledge sharing across disciplines and across national borders.

**Promoting a knowledge culture**
Efforts to promote the knowledge economy should focus on encouraging a culture of lifelong learning, where people are open to new developments and willing to assess new knowledge.

**Improving access to knowledge**
Access to knowledge can be improved by ensuring that the cost of computers and the internet is low, or free and accessible to all.
Bibliography


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Graduate education in sub-Saharan Africa

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This chapter assesses the current condition of postgraduate education in Africa. There is a critical need to expand high-quality postgraduate education to foster development, suggesting a regional approach is required initially. Most universities will face many challenges, however, including the need to rehabilitate much of the infrastructure, the shortage of PhDs, limited funding, the lack of a research culture and limited academic freedom. The author recommends a number of actions that can be taken, including focusing on high-quality centres, expanding PhD training, improving faculty research opportunities and increasing university autonomy, all of which will require substantial donor assistance.

In the 1960s and early 1970s, African higher education was flourishing. Its faculty members were especially productive and creative and teaching was given high priority, with tutorials and discussion sections at most universities (Sawyerr, 2004). By the late 1970s, the situation had changed dramatically for most of sub-Saharan Africa due to a combination of falling commodity prices, trade barriers, increasing prices for imports and political crises spawned by coups, authoritarianism and civil unrest. Around the same time, the World Bank concluded that development efforts in Africa should be refocused to concentrate on primary education through its ‘Education for All’ programme. Indeed, at a meeting with African university vice chancellors in 1986, Bank specialists had suggested that higher education in Africa was a luxury and that it might be better to close some institutions, or to send those graduates who needed work abroad (Brock-Utne, 2002: 8).

By the late 1970s, the combination of economic decline, trade barriers, the loss of favoured-nation status, reduced external funding, higher oil prices, as well as political crises in many of these states, caused major funding problems for higher education institutions. These were to have a devastating effect on most of Africa’s universities and other higher education institutions. Most suffered from budget cuts, salary freezes, staff reductions and the curtailment of recruitment. For most of sub-Saharan Africa,
this period was marked by a deterioration of facilities, the loss of research funding and other difficulties. These had a substantial negative impact on the quality of higher education at a time when the demands on these institutions were increasing.

Student numbers grew considerably in the 1990s. At the same time, many universities were suffering from staff shortages that were exacerbated by the ‘brain drain’ – the loss of qualified faculty members to more attractive job opportunities overseas. The quality of teaching in general declined for a number of reasons, including increased class sizes, the elimination of tutorials, the low level of qualifications of many teachers and the breakdown of the collegiality and sense of community. The quality of research and the number of publications also declined during this period, almost universally, due to the combination of a shortage of funds (Mugenda, 2009: 25), high teaching loads and low salaries. As a result, many researchers had to have second jobs to support their families and often diverted their faculty time to other activities.

The demand for graduates to contribute to national economic growth and to serve as centres of creativity and training for business, industry, government, entrepreneurship and the well-being of citizens, are putting additional pressure on higher education. Other developed and developing nations have invested heavily in the expansion of higher education because they have recognized its central role in development, so the gap between Africa and the rest of the world has grown (Gerritsen, 2009). These conditions have impacted both the ability to offer graduate training and its quality.

**GRADUATE STUDIES IN SUB-SARHAN AFRICA**

Strong graduate programmes provide the critical nexus between research and teaching and expand the opportunities for graduate research. The recognition that graduate programmes are a major avenue to enhancing the region’s intelligentsia and knowledge-creation capability has sparked the growth of regional training centres. In 2009, the World Bank identified 23 regional postgraduate programmes.

Table 1 gathers together information from 16 African states, which collectively account for 2.4 million students, almost two-thirds (60%) of sub-Saharan Africa’s estimated total student population of 4 million (World Bank, 2009: xxvi). Of these, more than 169,000, or 7%, are in postgraduate studies in 14 of the countries for which enrolment data are available. All 16 countries examined here have Masters programmes and 12 have PhD programmes. For the seven countries for which data are available, the average percentage of female students is 29%.

There are pockets of strength in postgraduate training in sub-Saharan Africa, especially in South Africa, and both the number and the size of programmes are increasing. Although several innovative and creative postgraduate programmes have
been developed in Africa in the last few years, a large number of obstacles (discussed in detail later) are limiting the expansion of higher education, as well as efforts to improve its quality and to foster strong graduate programmes. Countries are not only hampered by financial difficulties, but are also often limited or derailed by changes in the parties in power and a lack of political will on the part of those in power.

In many respects, postgraduate studies are hostage to the expansion of undergraduate training far beyond the human and physical capacities of institutions. For public tertiary institutions in particular, this expansion has drained resources, overburdened faculty members, encouraged ‘faculty flight’ (academic staff leaving a faculty) and reduced overall quality. Since faculty research is a critical backbone of postgraduate education, this too has hindered the development of these programmes.

With a few exceptions, graduate education has not played the role it was expected to play in promoting economic development or improving undergraduate education and public services. In part, this reflects the economic and political turmoil that has bedevilled a good many African states, the struggle against apartheid in Southern Africa, the neglect of the World Bank and most other donors (with some remarkable exceptions) for more than two decades, the high cost of information and other technologies and the failure of most African governments to give higher education in general the priority it required. Postgraduate education, other than in South Africa, has suffered from even more widespread neglect.

**OPPORTUNITIES AND POTENTIAL**

The importance of higher education for development is made particularly clear by Akilagpa Sawyerr (2004: 215): ‘What remains clear through all this is the crucial role that Africa’s systems and institutions for knowledge generation, synthesis, adaptation and application have to play in ensuring the advancement of the national interest on all fronts, economic, social, cultural and political. Central to these knowledge systems are the universities and their research and advanced training programmes. To a greater degree than elsewhere, Africa’s universities continue to provide the vast bulk of its research and train virtually all its researchers’.

The development of graduate education will be enhanced by encouraging more local training for faculty members, which helps to ensure a local cultural and historical component as an integral part of the instructional mission. In addition, strong postgraduate programmes at African universities provide an environment conducive to lively intellectual debate in which African academics ‘... must be able to critique and challenge external knowledge from their own perspectives, to reconstruct them for their own purposes and to generate their own theories, models, [and] analytical tools that variously incorporate and contest supposedly universal US or Eurocentric models’ (Szanton and Manyika, 2001: 17).
Table 1. University enrolments by degree type and graduate programmes in 16 selected African countries.

<table>
<thead>
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<th>Country (year of data)</th>
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* Total graduates Addis Ababa University only.
** University of Mauritius – only PhDs granted.
*** Estimated percent graduates, federal universities only.

nd = no data.
<table>
<thead>
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<th>Country</th>
<th>Year of data</th>
<th>Bachelors</th>
<th>Masters</th>
<th>MD/PhD</th>
<th>Total graduates</th>
<th>% female</th>
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There are practical and economic reasons to expand local postgraduate studies as well. Local training costs one-tenth of overseas training. Local graduate programmes also encourage bright young professionals to undertake postgraduate studies while they work and stay close to home and family.

In the short term, the number of outstanding postgraduate programmes in sub-Saharan Africa will be limited because of the conditions at many universities, the shortage of funds and the limited number of competent faculty members advising graduate students. Thus, a regional approach will probably be most effective for the next few years, focusing on the most promising existing graduate programmes. Hopefully, funders and governments will recognize the importance of supporting graduate students at the very best African institutions. Degrees from mediocre programmes will only prolong the difficulties of quality improvement. A focus on high-quality postgraduate training will require tough decisions about which universities will be able to provide the excellence needed, the teaching and research facilities required and a willingness to welcome students from other African countries. A core of excellence – dedicated scholars, researchers and administrators, as well as bright and energetic junior faculty members who are personally committed to serious scholarship and advanced graduate training (Szanton and Manyika, 2001: 42) – remains at most universities, but it is one that has, for the most part, been overworked and underpaid. What they need are the conditions, facilities and support to create the excellent programmes required.

Regional models can be established with help from governments, donor organizations and foundations. In the short term, such cooperation is critical. In the long term, this will help high-quality tertiary education institutions in sub-Saharan Africa and provide opportunities for African students to study in African countries other than their own, to broaden their cultural experiences and to give them the unique intellectual opportunities to work with some of the best minds in the world.

CHALLENGES FOR POSTGRADUATE EDUCATION
The challenges faced by institutions seeking to establish or expand high-quality graduate education in sub-Saharan Africa are substantial, as indicated above. This section discusses some of the major challenges.

Human resources
Among the most difficult problems to resolve are the human resource challenges. The problem of aging faculty members can be put off for a few years by raising the retirement age, as a number of universities have done. But in the long term, the shortage of well trained people with PhDs is making both the replacement of losses and the expansion of teaching staff difficult. Heavy teaching loads, low salaries, poor
prospects and limited funding for research are making faculty positions much less attractive than in the past.

As a consequence of poor service conditions, many faculty members have switched to private institutions or research-only contracts (Szanton and Manyika, 2001: 19), or they have taken jobs in non-governmental organizations (NGOs), or have gone overseas. The loss of faculty members from public to private institutions complicates postgraduate education even further, in that private higher education institutions on the whole offer little, if anything, in the way of postgraduate programmes.

**Administration and governance**

In far too many countries, public education has become a captive of national politics. Increased access is often a political issue rather than the result of a needs assessment, with student numbers expanded without expanding facilities or faculty numbers. In many countries, university presidents and chancellors are appointed for political rather than academic reasons, often by the head of state. Governments keep university budgets under tight control, while paying little attention to what these institutions actually need.

A new kind of academic leadership is needed, one that recognizes the changed environment of higher education. Moving through the ranks of academia from instructor to full professor is no longer enough to prepare even the most talented academics for senior administrative positions. In today’s environment, senior administrators need to be both seasoned academics and entrepreneurs able to raise funds, not only from government, but also from donors, business, graduates and ordinary citizens. In the new order, most university presidents will spend half their time raising money. That requires a keen understanding of finance, an outgoing and engaging personality, the gift of persuasion, patience and at the same time, a keen understanding of the academic process, teaching, research needs and human relationships. Not all of this can be taught, but much of it can be learned through training and special courses for senior administrators.

High-quality education is more likely in those systems in which academic and financial control resides at the university level. Where authority is highly centralized in a ministry or a commission, decentralization is needed. Without a high degree of autonomy, universities will not have the flexibility to create the innovative, creative knowledge responses required to deal with today’s development problems, nor will they be able to prepare the kind of graduates needed in the highly competitive global jobs market (Stern et al., 2000; Oyelaran-Oyeyinka, 2006). University governance needs to be enhanced at those institutions in which either the state or the chief executive officers continue to hold most of the power and control. Faculty members need to be in control of the academic life of the institution in a participatory governance structure that allows them to foster high-quality teaching, research and
service without external interference, and which guarantees academic freedom. Without this, innovation, creativity and discovery are difficult to achieve.

**Rehabilitation of infrastructure**

Higher education institutions face major challenges in the rehabilitation of infrastructure: buildings, laboratories, libraries, computer centres and teaching, research and study facilities. The cost of bringing most African universities up to where they should be will be gigantic.

**Funding**

The challenge of funding is most critical. As noted earlier, the amount of government funding provided has declined dramatically in real terms and per capita at most tertiary institutions. It is currently well below the minimum needed to operate at reasonable levels of quality and far below what is required to produce high-quality undergraduates and sustain graduate programmes.

In some cases, governments have not been willing to invest adequate levels of funding in higher education. Several countries also have restrictions about non-government sources of income that serve as disincentives to university entrepreneurship, including requirements that any income obtained from such efforts be returned to the treasury. On the other hand, the push for university entrepreneurship can be an excuse to limit government funding.

**Quality of the faculty**

Most sub-Saharan African institutions have a shortage of faculty members with PhDs. In most of the countries for which data are available, fewer than 50% of academic staff have PhDs. While this does not speak for the innate talent of the faculty members, the lack of training is a serious impediment to providing the kind of training needed for both undergraduate and postgraduate study. It poses especially critical problems for graduate programmes, where faculty must have PhDs to supervise PhD training.

Among the problems created by the shortage of PhDs among faculty members is the reduced number of people who can serve as Masters and PhD student advisors. Even among those with appropriate advanced degrees, there are often few who are active researchers themselves and thus appropriate models for postgraduate students.

**Research**

Critical to the development of strong graduate programmes is high-quality faculty research – scholarly inquiry that demonstrates excellence and makes an original contribution to knowledge in a particular field. Over the last 25 years, the output of scholars from sub-Saharan Africa has declined as measured by international journal publications (Tijssen, 2007). Sub-Saharan African publications in the sciences, for
example, have declined by 31% since their peak in 1987 (Tijssen 2007: 307). A major effort to improve research funding is imperative. Success in increasing research quality and output is essential to the development of high-quality graduate programmes. Thus, a multi-pronged effort is required to enhance research and to build centres of excellence. Establishing research administration programmes in African universities may help to improve the research environment.

**Academic freedom**
Without freedom to pursue teaching and research and to express and explore diverse ideas, high-quality university education and the development of knowledge societies will be difficult if not impossible to achieve. Unfortunately, we are all too familiar with the number of scholars who have suffered from the suppression of free speech, their intellectual pursuits and research in Africa.

**Structural problems for postgraduate study**
There are a number of structural problems that hinder the effectiveness of postgraduate programmes. One is the length of time it takes to get a Masters or PhD in many institutions. In documented cases, few people actually obtain a two-year Masters in two years; the average for a PhD, which is generally described as a four-year programme or two years beyond the Masters, is at least six years, and often more.

**The dangers of inbreeding**
Most universities have rules against hiring their own graduates, at least until they have worked at another institution and proven their academic worth. Yet, the shortage of people with PhDs who are available for recruitment has led to an expansion of efforts to ‘grow your own’ PhDs and to waive this restriction. Nonetheless, the prohibition is worth revisiting. The danger of hiring one’s own graduates is that the institution perpetuates the ideas of existing faculty members and does not get an infusion of new and often different, points of view gained from graduate work elsewhere. If the number of home-grown PhDs becomes very large, there is a real danger that the institution will stagnate. For large countries with several universities, the solution is to send potential employees to other universities in the same country. Often they can do their coursework while on leave as instructors and return to teach while they complete their PhDs. Another useful approach is the ‘sandwich’ programme. This provides experience in another university for six months to a year during the graduate programme and access to a very different academic environment.

**Narrowness of postgraduate training**
Most postgraduate programmes in Africa follow the British and European model of research Masters and PhDs. These rarely involve any graduate classes or seminars
on research methods or theory of the discipline. The focus of the programme is on the selection of a research topic, approval by the department, fieldwork, write-up, consultation with an advisor (and perhaps members of one’s committee) and defence of the thesis. For students who come from rich and varied undergraduate programmes, in the European tradition, this seems to work well. But where their undergraduate programmes have been weak, as they are in much of Africa, the student is often deficient in knowledge of his or her field and the thesis/dissertation model does not provide opportunities for the breadth needed to be adequately prepared in a field.

Several universities are experimenting with a US-type model, which provides both formal graduate class work and a thesis at the Masters level. The PhD is built on this base. This mix of courses and thesis helps bring students up to date in their fields, enhances research methods, helps create a culture of research and provides breadth in the student’s training. This overcomes the narrowness of research-only Masters and PhDs.

**Lack of support for graduate students**

In most African countries with postgraduate programmes, there is limited support, if any at all, for graduate students. Few have much in the way of research funding for graduate dissertation research, or housing. Few universities have adequate facilities for graduate teaching, whether it is laboratories, access to computers and the internet, transport for field work, or office space in which to work. Few libraries have focused on the research needs of postgraduate students and the kinds of journals, books and data they might need. The lack of research support greatly limits their choice of topics, stifles their creativity and limits their potential.

**Private university competition**

The number of new private tertiary institutions established over the last decade presents both problems and opportunities for postgraduate study. Most private universities hire at least some faculty members from public institutions to do much of their teaching, either on a full-time basis or part time. Thus, public tertiary education ends up subsidizing private tertiary education. In many cases, faculty members neglect their public university duties in favour of the private institutions, which increases the load on the rest of the faculty and deprives the students of needed contact with their professors.

Private higher education institutions in Africa have tended to have less focus on research. In the long term, the competition of private universities with public institutions can be beneficial in raising the standards of both public and private universities. At the present time, most private institutions are not investing in postgraduate education. Private institutions are contributing to the internal brain
drain of public institutions in some countries, where they are able to pay higher salaries than public institutions. Nonetheless, in the long term, some private higher education institutes, especially the non-profit institutions, will be major contributors to high-quality postgraduate education in Africa. Their autonomy gives them tremendous flexibility, they are often very responsive to business and employer needs and they frequently have clearer missions and goals focused on high quality as part of their attraction to students and parents.

**MAJOR PLAYERS**

International organizations, foundations, NGOs, governments and consortia involved in postgraduate education abound in Africa. Since 2002, the World Bank has become a major player, after having almost totally abandoned African higher education for 15 years. UNESCO has also been very active, focusing on conferences, workshops and capacity building.

Among the most successful development efforts have been those of several national governments and foundations, including the Partnership for Higher Education in Africa, a consortium of seven US-based foundations. Other significant contributions to higher education have come from major development partners.

Taken together, the above challenges to the development of high-quality postgraduate education set out an agenda for change. For most sub-Saharan African universities, these challenges represent the case that needs to be made to governments, the public, business, students, parents, donors and others. At the same time, tertiary institutions need to put their financial houses in order, making sure they are efficient, eliminating unnecessary programmes, maximizing the funding they have, seeking entrepreneurial opportunities that are appropriate to their academic and research missions and taking advantage of new funding possibilities when they arise. For most countries, the improvements needed will require a reordering of national priorities to place higher education more prominently on the list than it is at present.

**STRATEGIC IMPLICATIONS**

The overall state of postgraduate education in sub-Saharan Africa is not particularly good, and the current international economic crisis will not help. At the same time, there are a number of promising developments.

In the public sector, governments will need to give universities the autonomy required to control their own administration, finances, research and academic programmes including graduate study, if they do not already have it. Some countries will have to be convinced to make a major commitment to improve the quality of higher education including graduate programmes. Universities will have to
demonstrate greater efficiency and transparency to ensure and enhance public trust and accountability.

Obtaining the funding needed for high-quality graduate education programmes in sub-Saharan Africa will require that academic leaders do a more effective job in making the case for state-of-the-art postgraduate education – including a willingness to make the case for assistance to an institution in a neighbouring state. For states without good candidates for postgraduate programmes, their assistance might be to provide full funding for their best graduate students to attend the neighbouring institutions that are, or can be supported to become, regional graduate studies centres. It might also include the ‘loan’ of outstanding faculty members, researchers and teachers to these regional centres for a semester or two on a regular basis. Success will also require regional efforts to demonstrate agreement on the universities to be targeted for funder support in the region.

It will be important to pick target universities only in those nations where the government is willing to make the funding commitments necessary, in which academic freedom is guaranteed and where a culture of research is already in place. Given scarce resources, it is going to be critical to avoid wasting time or funds on efforts that do not meet the conditions for success.

The Masters and PhD programmes themselves might be built around some successful experiments now under way. These include a number of successful models of cooperative arrangements with African universities and international partners in Scandinavia, Europe, the United Kingdom, the United States, Asia and elsewhere. There are also a number of cooperative regional and multinational efforts between African states that might serve as the basis for regional graduate programmes.

Distance education has also been suggested as a possible solution to the access problems of graduate education. Online study programmes in particular offer opportunities for certain categories of postgraduate students – those who are employed, work in isolated areas, or have physical disabilities that make it difficult for them to get to a university campus. But distance education does not seem to be a good candidate in the main for the high-quality postgraduate education needed. While distance education does not appear to be the answer to the high-quality postgraduate programmes needed for development in sub-Saharan Africa at the present time, it can supplement them (for a discussion of distance education, see the chapter by Mufutumari, page 73).

In the short term, private higher education does not seem a likely candidate for the expansion of high-quality postgraduate education in sub-Saharan Africa either. Few private tertiary institutions are involved in postgraduate training. On the whole, they find it too expensive. This is especially true of for-profit private institutions. In the long term, some private higher education institutions will become more involved in postgraduate education.
RECOMMENDATIONS
There are a number of concrete actions that can be taken to develop graduate education in sub-Saharan Africa.

The primary focus in the development of graduate education in Africa must be on the development and expansion of high quality, state-of-the-art programmes. Without high quality, the programmes will be of limited value to both the students and the region. In the short term, this means that the number of postgraduate programmes will need to be limited and in most cases will have to be regional rather than national in focus, with a few exceptions for large countries.

Funding
• Major concerted efforts – nationally, regionally and internationally – need to be continued and expanded to ensure adequate financial support for graduate education.
• Scarce resources should be focused on those institutions that currently have the greatest potential to offer high-quality graduate programmes within a region. Funding such programmes will require a combination of state funds, donor money, tuition fees (or grants and loans) for students and strong public support.
• Pressure to create graduate programmes for nationalistic reasons, without adequate resources, should be resisted.
• Immediate efforts should be made to organize regional graduate programmes. The first step should be to identify one or two potential regional centres for graduate study and plan to develop or expand their programmes. The key challenge will be to obtain the required cooperation of the regional governments and universities.

Recruitment
• Given the impending retirement of large numbers of faculty members, expanding PhD training is critical if universities are to maintain their undergraduate programmes, improve quality and expand graduate programmes.
• The recruitment and retention of first-rate faculty members in the long term will require appropriate salaries and working conditions. It is important to recognize that this is a highly competitive market nationally and internationally.

Students
• As part of the expansion process, it remains important for some of the best students to attend universities overseas in order to broaden their horizons, provide breadth to the expansion of graduate programmes and to give these young academics access to the best training and best minds.
• Critical to high-quality graduate programmes is the need to strengthen faculty research. That will require substantial additional funding for research. Government
and private research funding, on a competitive basis, should be encouraged for both private and public universities.

- Funding for graduate students should be a priority with students allowed to carry that funding to any high-quality graduate programme in sub-Saharan Africa.

**Autonomy**

- Academic freedom on all university campuses in sub-Saharan Africa must be a high priority. It is a condition of effective teaching and research and vital to successful graduate programmes.

- High-quality graduate education and research require high levels of university autonomy from government. Academic and financial autonomy needs to be encouraged for both public and private education.

- Special programmes should be instituted in conjunction with the creation of high-quality graduate programmes to encourage the return of outstanding academics from abroad.

- Donors should be encouraged to fund joint research projects for scholars from both inside and outside Africa.

- The link between quality higher education and national development needs to be emphasized and understood.

- Maintaining and improving the quality of the academic environment, including infrastructure, needs to be a priority at all higher education institutions, in order to enhance quality, attract and keep outstanding faculty members and foster first-rate teaching and research. Governments need to recognize the critical nature of this investment.

**Bibliography**


Regional and international cooperation provides several opportunities for higher education and research in Africa. If sustained efforts are not made to take up the challenges and respond to the threats emerging from globalization processes, this may lead to the further marginalization of African institutions. This chapter discusses the role of regional and international academic and research cooperation in strengthening the capacity of African institutions in the context of the knowledge economy.

With the emergence of the knowledge economy, there is growing recognition of the importance of higher education and research for poverty reduction and sustainable human development. In recent years, several steps have been taken to help create the conditions needed for African countries to gradually move from commodity-based to knowledge-based economies. For example,

- at its recent summits, the African Union has adopted and is now implementing action plans that are likely to help accelerate progress towards achieving the Millennium Development Goals;
- donor countries and the international community have pledged to support infrastructure development and human capacity building at African institutions, through academic and research cooperation.

The role of higher education and research in development was reaffirmed at the World Conference on Higher Education, held in Paris in July 2009. Indeed, the conference communiqué noted that ‘... At no time in history has it been more important to invest in higher education as a major force in building an inclusive and diverse knowledge society and to advance research, innovation and creativity’ (UNESCO, 2009a). A special roundtable dedicated to Africa was convened in recognition of the urgency of helping higher education institutions to be more responsive to societal needs. The
roundtable reaffirmed the need to strengthen institutional, national, regional and international collaboration in order to support the establishment of a high-quality African higher education and research area.

REGIONAL AND INTERNATIONAL COOPERATION

Since the establishment of the African Union (AU) in July 2002 and the New Partnership for Africa’s Development (NEPAD) in July 2001, cooperation between Africa and other regions and the international community has developed and diversified rapidly. This assessment is based on the number of new partnership agreements adopted in the past few years and pledges made by donors to provide financial support to African countries.

In November 2002, the UN General Assembly adopted a resolution establishing NEPAD as the main framework for collaboration between Africa and the United Nations system (UN, 2002). Since then, UN activities in Africa have gradually been aligned with the priorities and programmes of the AU/NEPAD. These activities are implemented through nine thematic clusters and ten sub-clusters, covering the priority areas of the AU/NEPAD.

Following the recommendations made by the Commission for Africa – a partnership between African countries and the international community – the G8 pledged to support higher education and research networks, in particular networks of centres of excellence in science and technology (G8, 2005), although this has been only partially delivered (ONE International, 2009). The Lisbon Summit between the European Union (EU) and the AU, held in December 2007, also defined a cooperation framework for partnership, including capacity building for science and technology (EU–AU, 2007a,b). The EU member states have pledged to increase their official development assistance from 0.4% of GDP in 2008, to 0.56% in 2010, and to 0.7% in 2015 (European Commission, 2009).

The effectiveness of aid provided to Africa has gradually increased since the signing of the Paris Declaration in March 2005 by over 100 countries and agencies. Following the five principles of the Paris Declaration – ownership, alignment, harmonization, results and performance indicators, and mutual accountability (High Level Forum, 2005) – the donor countries are now providing aid through general budget support according to the priorities defined by the countries in their Poverty Reduction Strategy Papers, which are regarded as national action plans for achieving the Millennium Development Goals.

The summit of the Forum on China–Africa Cooperation, held in Beijing in November 2006, adopted a strategic partnership to strengthen cooperation in several areas including agriculture, infrastructure, industry, education, science and technology, public health and information and communication technologies (ICTs).
China pledged to provide more support to train African professionals and to increase the number of scholarships awarded to African students each year, from 2000 in 2006 to 4000 in 2009 (Forum on China–Africa, 2006).

The Yokohama Action Plan, developed at the Tokyo International Conference on Africa’s Development in May 2008, also identified several areas of cooperation in higher education and research. These include strengthening partnerships between universities and research institutes, promoting dialogue on science and technology and expanding South–South cooperation in higher education and research (TICAD IV, 2008a,b). The AU also adopted cooperation partnerships with India and Turkey in 2008 (African Union Commission, 2008a,b; Turkey–Africa Cooperation Summit, 2008a,b).

ACADEMIC COOPERATION

As documented in recent publications such as Higher Education in Africa: The International Dimension (Teferra and Knight, 2008), there is a long tradition of regional and international academic and research cooperation in Africa. Such cooperation has played a major role in helping higher education institutions to develop their human resources using a variety of means, including student and staff exchanges, intergovernmental schools, joint degree programmes and networks linking university departments. Sub-regional mechanisms are also in place, such as accreditation bodies to ensure the quality of institutions and programmes, and the recognition of qualifications.

In 2008, the number of higher-education students who left sub-Saharan Africa represented, on average, 5.8% of total enrolments. In seven countries, the figure was higher than 30% (UNESCO, 2009b). Student mobility out of Africa is driven by the limited capacity of many institutions, the declining quality of education and the students’ desire to enrol in international study programmes that may open up better job opportunities. It is anticipated that academic mobility within Africa will increase in the coming years for at least two reasons: the increasingly restrictive visa regimes in the developed countries and the ongoing efforts to create an African higher education and research area.

Almost all African universities have signed cooperation agreements with partners around the world. For instance, in 2008, five universities in South Africa were actively involved in more than 520 agreements (Jansen et al., 2008). Within the francophone countries, the African and Malagasy Council for Higher Education (CAMES) is now promoting academic cooperation, with programmes focusing on quality assurance, accreditation of institutions and recognition of academic qualifications. International groups of scientific leaders also play an important role in academic and research cooperation in Africa.
Despite the contributions of such cooperation programmes, however, African institutions still face the challenges of poor infrastructure, inadequate funding, the high cost of internet connectivity, the lack of human resources, and their inability to train and retain highly skilled academic staff and researchers.

According to the recent World Bank report, *Accelerating Catch-up: Tertiary Education for Growth in Sub-Saharan Africa* (2009), donor funding for university research is heavily concentrated in fields such as health, poverty analysis, environmental resources, education and gender issues. However, since the adoption of Africa’s consolidated plan of action for science and technology and the African regional plan for the knowledge economy, there is increasing commitment at the international level to support infrastructure development, as well as research capacity building in science and technology and ICTs. This shift is in line with the urgent need for Africa to develop the capacities required to benefit from the knowledge economy, which in turn is heavily dependent on the availability of human resources, the promotion of innovation and the wise application of knowledge, research and ICTs for development.

**OPPORTUNITIES AND POTENTIALS**

Several actions have been taken to revitalize higher education and research institutions in Africa. These new developments will provide opportunities for enhancing regional and international cooperation in higher education and research, as outlined in this section.

**Enhanced funding**

Since 2005, donors have made several commitments to support the implementation of the AU/NEPAD programmes at regional, subregional and institutional levels. The AU is setting up an African Science and Innovation Fund to support the implementation of the Africa’s Science and Technology Consolidated Plan of Action. It is also establishing an African Research Grants Programme to fund research in several areas of development, including agriculture, energy and water (Nordling, 2009).

Following the increasing trend towards providing general and sectoral budget support, some donors are providing assistance in line with the Paris Declaration on Aid Effectiveness. At the 2009 World Conference on Higher Education, several traditional partners and emerging countries such as Brazil, India, South Korea and China also pledged their support for higher education and research cooperation in Africa (Teferra, 2009b).

African countries need to establish appropriate mechanisms to ensure that by the time donor support comes to an end, the capacities that have been built up are sustainable, and are further strengthened at both national and regional levels.
Virtual cooperation

Partners in developing and developed countries have achieved results by participating in various academic and scholarly partnerships and online collaboration. Some of the knowledge generated at the global level has been used to develop capacities at national and regional levels. For instance, the Pan-African e-Network Project, an initiative funded by the Indian government to promote telemedicine and e-learning in Africa, is expected to connect more than 100 African hospitals and universities to hospitals and universities in India via virtual satellite networks.

In another example, the Internet Laboratory project, African students are able to perform science and engineering experiments online in the laboratories of the Massachusetts Institute of Technology in the United States. Indeed, one participant, Nigeria’s Obafemi Awolowo University, has used the knowledge gained from the project to establish two electrical engineering internet laboratories (Shabani, 2008).

Institutions in developed countries are also benefitting from knowledge produced in African countries and are using it to broaden their research opportunities. For example, the National Virtual Library of Nigeria has uploaded locally published journals to its website in order to share the contributions of Nigerian researchers with regional and global research communities. This initiative has generated interest at the international level and led to the formation of research partnerships between institutions in Nigeria and developed countries (NVL, 2009; Okebukola, 2009). The initiative has also helped to increase the citation scores and impact of articles in Nigerian journals at national, regional and global levels.

There is an urgent need to raise the awareness of higher education and research communities and policy makers regarding the opportunities offered by these facilities and to build the capacity needed to enable individuals and institutions to use them to improve the quality of teaching and research.

CHALLENGES

This section briefly reviews some of the many challenges facing regional and international academic and scholarly cooperation in Africa, including:

- the nature of the principles guiding North–South partnerships;
- the high cost of bandwidth and the lack of capacity to ensure the effective use of online technologies for teaching and research;
- the increasing brain drain of African professionals;
- the lack of research infrastructure; and
- the lack of comparability of academic programmes, which hampers the mobility of academics between different language regions.
**Policies and principles**

As in the case of development cooperation, academic and research cooperation should be based on the five principles of the Paris Declaration. Unfortunately, the implementation of two of these principles – alignment and harmonization – is still a major challenge that threatens to further weaken the capacity of African institutions.

For the past few years, some progress has been made in coordinating donor support to African countries and institutions. This is reflected in the adoption of joint assistance strategies and the increasing use of budget support and basket funding mechanisms. Yet despite these positive developments, academic and research collaboration in African universities still involves several donors with different policies, objectives and reporting systems (Teferra, 2009a).

Managing these partnerships is a challenge for African institutions, since it requires a capacity that is already quite limited. There are also challenges for donor-country institutions. Indeed, some donor countries have assigned dual objectives to academic and research cooperation schemes: to develop individual and institutional capacity in Africa and, at the same time, to increase research opportunities at institutions in the donor country. Institutions in developed countries also find it difficult to collaborate with African institutions due to their poor infrastructures and limited human capacity.

**Bandwidth**

Despite the launch in July 2009 of EASSy, the submarine fibre-optic cable system linking countries in Southern and East Africa to global networks, African higher education institutions still have limited access to international fibre-optic infrastructure. Instead, they continue to rely heavily on expensive satellite bandwidth. In these circumstances, academic staff and researchers at African institutions cannot access the same level of information and services as their counterparts in developed countries, since online research is slow and expensive. In addition, higher education institutions lack the capacity needed to benefit fully from the potential of virtual technologies to improve the quality of teaching and research. They also lack the skills required to ensure the effective management of their information systems (for a discussion of this issue, see the chapter by Anna Bon, page 59).

**Brain drain**

Regional and international cooperation is hampered by the phenomenon of the brain drain, which has weakened the human capacity of African universities to engage fully in academic and research partnerships. The brain drain from African countries is not limited to movements to developed countries, but also to other African countries that may offer political stability and better living and working conditions. It is now agreed that the brain drain may worsen in the coming years.
because developed countries are increasingly establishing new immigration policies, such as the EU's Blue Card scheme, aimed at attracting highly skilled professionals from developing countries.

Instead of concentrating efforts on developing strategies aimed at stemming the brain drain, the challenge for African countries is to find out how their higher education and research institutions could benefit from the expertise of Africans in their diasporas, for example through the use of virtual technologies and research knowledge networks (for a discussion of this issue, see the chapter by Damtew Teferra, page 83).

**Lack of research capacity**

All the indicators used to measure the level of institutional development show that the research capacity of African universities is among the weakest in the world (Shabani, 2008). Moreover, the research capacity in Africa is concentrated in a limited number of countries and disciplines; for further discussions of this issue, see the chapters by Olusola Oyewole (page 19) and Fred Hayward (page 31).

**Academic mobility**

Africa is unable to offer academic and research programmes in all areas of scholarship. Therefore, it is necessary to encourage academic mobility to benefit from programmes offered by other institutions in Africa and beyond. However, because of the diverse degree structures and the policies regarding accreditation, credit transfer and quality assurance in different language zones, it is currently difficult to compare academic programmes. This is a major barrier to regional and international academic and research cooperation.

**MAJOR PLAYERS**

Several players are involved in the development and delivery of regional and international academic and research cooperation programmes in Africa. These include the AU, the EU, the World Bank, the African Development Bank (ADB), subregional and regional university associations and various American foundations through the Partnership for Higher Education in Africa.

- **African Union.** Since 2006, the AU has adopted several action plans that are now guiding the development and delivery of regional and international academic and research cooperation. As indicated above, the AU has also developed major North–South and South–South partnership programmes, in particular with the EU, Japan, China and India.
- **European Union.** The most relevant actions with regard to regional and international academic and research cooperation relate to the 8th Africa–EU Partnership on Science, Information Society and Space.
• **World Bank.** The Bank supports the development of quality assurance and accreditation mechanisms at various levels. These mechanisms play a crucial role in promoting academic and research cooperation by facilitating academic mobility. With the publication of its new policy document (World Bank, 2009), it is expected that the Bank will play a role in strengthening international academic and research cooperation.

• **African Development Bank.** Since 2006, the ADB has provided grants to regional economic communities to support cooperation in areas such as science and technology, distance education, research capacity development, and the promotion of ICTs in academia.

• **Partnership for Higher Education in Africa.** The Partnership for Higher Education in Africa is made up of seven American foundations committed to providing support to 49 universities in nine African countries (Shabani, 2008).

**STRATEGIC IMPLICATIONS**

It is well established that in the knowledge economy, regional and international academic and research cooperation play a major role in the process of generating and disseminating knowledge. Current and future trends in the development of higher education and research show that African institutions may benefit from several opportunities, as described in the following.

**Establishing an online clearing house**

Some African scholars do not participate in regional and international partnerships because they are simply not aware of the opportunities available. It may be useful to recommend to the AU and the EU that they develop an online clearing house and database as part of the implementation of the 8th Africa–EU Strategy on Science, Information Society and Space. All partnership programmes could be requested to contribute information to the database according to a prescribed format.

**Building capacity for virtual technologies**

Several virtual technologies are available to enable African institutions to better engage in academic and research partnerships. Unfortunately, a sizeable component of academic staff and researchers in Africa do not have the knowledge required to access and use online resources and virtual facilities. Regular capacity-building training programmes are clearly needed to update their knowledge and upgrade their skills.

**Developing postgraduate programmes**

It is recognized that research capacity in African universities is very limited and that this capacity has been further weakened by the persistent phenomenon of the brain
drain. In order to be able to participate effectively in research partnerships, African universities need to develop research training programmes that will ensure a critical mass of researchers in priority development areas. Such training programmes should necessarily build on the use of virtual technologies and participation in regional and international research and knowledge networks (see the chapter by Fred Hayward, page 31).

**Building quality assurance mechanisms**

African countries are committed to developing a regional higher education and research area in order to support academic mobility in the continent. This process requires the establishment of viable mechanisms for accreditation and quality assurance, or strengthening/expanding existing ones, in order to ensure the comparability of academic programmes and qualifications.

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Information and communication technologies in tertiary education in sub-Saharan Africa

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All universities need to connect to the global knowledge backbone in order to enhance research, innovation, teaching and learning. Yet most African countries lack reliable access to this backbone as a result of the nascent state of information and communication technologies (ICTs) in their institutions. African institutions face many challenges – infrastructural, technical, organizational and political – and are making concerted efforts to address them. This chapter examines the status and potential of ICTs in institutions in eight African countries, and offers a set of recommendations on ways to promote ICTs, as well as the development of institutions and countries in general.

Information and communication technologies (ICTs) have greatly accelerated the process of globalization in recent decades. ICTs have increased world productivity and global trade, facilitated business and industry growth, and enhanced education and research collaboration. Countries are benefiting enormously from ICTs, through innovation, communication and access to global information. ICTs are key to ensuring an inclusive global knowledge society.

Not all parts of the world have benefited equally from ICTs, however. Whereas many industrialized countries and countries in transition have built up their knowledge economies, most developing countries, particularly in Africa, remain on the underprivileged side of the digital divide, as the the disparity between countries or regions in access to ICTs is called (Davison et al., 1999; Norris, 2001; Qureshi, 2006). The idea is that narrowing the digital divide will lead to poverty reduction through economic growth.

The awareness of the urgent need for ICTs has led African governments to set new priorities and introduce policies to promote and support ICTs for development. Although Africa is catching up in some respects, such as mobile telephony, improving
access to fast and reliable internet connectivity remains problematic. This poor connectivity, which hampers research, education and the dissemination of knowledge, is an example of the pervasiveness of the digital divide.

Assessment of the current state of ICTs in tertiary education, and observation of emerging trends can reveal the potentials and opportunities of ICTs in building information societies. Nevertheless, many political, financial and structural factors still hamper the implementation of ICTs in sub-Saharan countries. It is necessary to address these bottlenecks in the quest for relevant solutions.

This chapter explores the current state of access to ICTs within tertiary education in sub-Saharan Africa, based on case studies of eight countries: the Democratic Republic of Congo (DRC), Ghana, Kenya, Malawi, Mauritius, Mozambique, Tanzania and Uganda.

The term ICTs here refers not only to hardware and software – including computer networks, wireless telecommunication, computer and network equipment, cables and mobile telephony – but extends to the internet as a whole, and to the global and local repositories of information, including methods of storing, retrieving and using that information. The term also covers conventional technologies such as television and radio, which remain very important means of communication and sources of information, especially in Africa.

**OPPORTUNITIES AND POTENTIALS**

One of the channels through which tertiary education can enhance economic development is through technological catch-up. According to Bloom et al. (2006) Africa’s current production level is 23% below its potential. By increasing public investment in tertiary education, targeted at promoting technological innovation, African countries could increase their output considerably.

It is clear that if tertiary education institutes in developing countries are to take the lead in promoting innovation, governments must create appropriate conditions and provide funds to enable them to do so. Tertiary education institutes should be more proactive in their pursuit of technological and innovative leadership. Perhaps the best examples of their innovative power include the world wide web, and the internet, which have emerged from universities and research institutes (Stanton and Stöver, 2005).

The benefits of ICTs as tools for teaching and learning are widely acknowledged. In the literature, electronic learning, or e-learning, is often hailed as a source of innovation in teaching and learning. E-learning environments, web 2.0 tools, wikis, shared spaces, videoconferencing and many other tools have been successfully adopted in educational practice around the world.

ICTs are now indispensable in tertiary education, cutting distances, bridging frontiers and thus contributing to the virtual compression of time and space. The internet, now the world’s largest knowledge database, is a vital source of information.
for research and education. This dynamic repository of knowledge is expanding rapidly as the number of users continues to grow. The enormous size and chaotic nature of the internet could have made it useless, had it not been for intelligent search engines such as Google, Yahoo! and, more recently, the semantic web.

**E-learning**
The introduction of e-learning – the use of digital and media technologies for educational purposes (Armitage and O’Leary, 2003) – undoubtedly represents the most revolutionary development in educational practice. The internet and the world wide web have captured the imagination of educators around the world, resulting in the emergence of a massive global education market in less than a decade.

The opportunities of globalizing knowledge through the internet have resulted in the enormous expansion of tools for teaching and learning. Pedagogical approaches to e-learning have led to new insights, and new technologies have been optimized to enhance teaching and learning. ICTs are now being integrated into the classroom, replacing face-to-face teaching, or used in a mixture of modes called ‘blended e-learning’.

E-learning is an important tool for distance education, which was already widespread in Africa prior to computer technologies. E-learning offers many benefits:
- offering instant access to global educational resources;
- allowing easy creation, update and revision of course materials;
- enabling more flexible interactions between teachers and students;
- making it easy to combine text and multimedia;
- providing easier access to remote experts;
- allowing interactive and dynamic learning experiences through online assessment tools, discussion groups, forums, simulations and animated learning objects; and
- providing opportunities for cross-cultural and collaborative learning without distance constraints (Sharma and Mishra, 2008).

**Access to global information**
Access to the internet can substitute for printed books and scientific journals. This can be cost-effective for educational institutes in developing countries. In support of this, many educational institutes have made their academic curricula available through the internet. A good example of an ‘early bird’ in these initiatives is the Massachusetts Institute of Technology in the United States, which has made its curricula available online (MIT, 2001).

There are currently many other initiatives by academic publishers to offer access to research databases to universities in developing countries without charge, or at very low cost. Three of these initiatives are:
- The Health InterNetwork Access to Research Initiative (HINARI), launched by the World Health Organization in January 2002, offers access to some 1500
journals from major publishers such as Blackwell, Elsevier Science, Springer and Wiley. Since then, the numbers of participating publishers offering journals and other full-text resources have grown remarkably. More than 6200 journals are now available in HINARI, and the number is growing.

- The AGORA programme, set up by the UN Food and Agriculture Organization (FAO) together with major publishers, enables developing countries to access digital library collections of more than 1000 journals in the fields of food, agriculture, environmental science, life sciences and social sciences.
- Online Access to Research in the Environment (OARE), an initiative of the United Nations Environment Programme (UNEP), Yale University and leading science and technology publishers, is intended to enable developing countries to access one of the world’s largest collections of environmental science research.

Research collaboration

World-spanning online collaboration, enabled through ICTs, has helped to enhance global research over the past decade. One remarkable example of this has been the Human Genome Project (HGP), a massive effort to map the entire human genome that would never have been possible within the given timeframe, without the virtual research networks that enabled online collaboration among numerous diverse participating institutes worldwide.

In Africa, research and academic publishing are in a poor state, and research infrastructures are inadequate (Teferra and Altbach, 2004; Hayward, this volume). Collaborations for research in Africa are crucial. ICT infrastructures allow African universities to join the international research community, to improve local publishing opportunities and build their research capacity. African universities can now produce valuable information and make it available through the internet, increasing the synergy needed to achieve scientific excellence, while at the same time enhancing their knowledge-generating capabilities.

The importance of collaborative research is now widely recognized in international research circles. One notable initiative is the Network of African Science Academies (NASAC), which was formed by the African Academy of Sciences (AAS) and eight African national science academies. The initiative is now connecting to the European Science Foundation (ESF) and the International Council of Science (ICSU) to stimulate research for development.

One important example of inter-tertiary education collaboration has been the formation of National Research and Education Networks (NRENs). In sub-Saharan Africa there are several such initiatives, such as the UbuntuNet Alliance, established in 2006 and composed of more than 40 universities, which helps universities collaborate in the formation of NRENs.
Mobile telephony
Mobile telephony in Africa has grown dramatically, from one in 50 people owning a mobile phone in 2000, to one in three in 2008 (ITU, 2009a). For tertiary education, the widespread availability of mobile phones makes them valuable tools for research and education.

CHALLENGES
The successful deployment of ICTs in tertiary education in Africa faces numerous challenges. Some of them are internal, and can be addressed at the institutional level, while others are external, affecting higher political or socio-economic levels. The interrelationships between internal and external challenges are complex, and external factors may also strongly influence the internal situation. The broad context of ICTs in tertiary education must therefore be taken into account, involving all aspects including government, private sector and international donor engagement.

A variety of technical weaknesses are evident in ICT infrastructure in African universities. Internet capacity (bandwidth) is often insufficient and the quality is poor. Shortages of computer equipment and software and poor data security are widespread. The bandwidth is often depleted by inadequate management of campus networks, leading to power cuts, service denial, poor security and virus attacks, all of which lead to even lower bandwidth capacities. Other problems include the poor state of much ICT equipment, and the high software licence fees.

These problems are often directly attributed to a host of technical issues, the lack of funding and shortages of skilled technical support staff. But this tells only half the story – the underlying causes of the problems are not as straightforward as they seem.

The technical shortcomings of the ICT infrastructure at many African universities can be attributed to factors at the institutional level, which can be summarized in three broad categories: physical infrastructure, knowledge infrastructure and management structure.

First, the physical ICT infrastructure – which is most clearly observed when it is not functioning properly – includes physical equipment and hardware such as computers, printers, scanners, network equipment, cables, routers, satellite dishes, etc., as well as the software and the data being processed.

Second, the knowledge infrastructure consists of the organization of human resources with the ability, skills and knowledge to maintain the ICT infrastructure, to support end-users and deliver all the necessary ICT services. The knowledge infrastructure should include a functioning and service-oriented ICT team within an institution, with clear responsibilities and tasks and operational policies and budget. Since the ICT team is responsible for all ICT services in an organization, it must have a high enough status and thus sufficient influence within the organization to guide the ICT strategy over a long period. A good knowledge infrastructure implies that
good technicians are available to maintain the network, but also ICT-skilled lecturers and application specialists who can deploy e-learning tools and teach students how to use them.

A properly functioning ICT department must have the necessary tools and abilities if they are to optimize existing ICT resources and network bandwidth. A lot can be gained in terms of quality of service if appropriate ICT policies are implemented within the institution.

Third, the physical and knowledge infrastructure cannot function appropriately without a proper institutional management structure. The management should enable the whole ICT process by providing adequate funding and human resources management, and by assigning and delegating responsibilities. Ensuring the full alignment of the institution’s ICT strategy with its overall strategy and policy is also an important task for management.

Within many tertiary education institutes, management structures often represent difficult bottlenecks in the successful deployment of ICTs. Lack of awareness or knowledge of ICT strategies at management level are among the structural challenges for successful deployment of ICTs. Weak management can result in many problems, including the failure to assign responsibilities for ICT maintenance and support, inadequate funds for replacements and maintenance, and a lack of relevant policies that may result in weak or absent service agreements between the ICT support units and users, or the procurement of inappropriate equipment.

By keeping abreast of the latest insights into ICT strategy, senior managers would be more aware and capable of guiding their organizations into the information age.

Important external factors hampering the proper deployment of ICTs in tertiary education are the high rates of turnover of skilled ICT staff, and poor and expensive internet connectivity. Staff retention is a major issue at many African universities. This high turnover is a complicating factor for many universities that are unable to offer competitive salaries to retain their ICT staff. The wide disparity between the salaries of those employed at universities and those in the private sector is significant. Donors often provide funds for ICT equipment and its implementation in education projects, but fail to address the problem of retaining ICT staff. This problem cannot be solved overnight, and needs much creativity by all stakeholders.

Another major external factor is the (lack of) availability of reliable, fast and affordable internet connectivity. At many African universities, internet connections are only good enough to send and receive emails or download documents, very slowly. Other uses of the internet, such as quick browsing, or using web 2.0 tools, shared online collaboration and other bandwidth-consuming applications are virtually impossible because of the low bandwidth. The poor quality of internet connections is a problem that seriously impedes innovation and improvements in teaching and learning at African universities, and especially distance education.
The high cost and poor quality of internet connectivity in Africa is a problem for tertiary education and for society as a whole. The main challenge, therefore, is to bring the costs down. Can tertiary education play a role and influence such political and economic decisions? A solution could be the formation of bandwidth consortia, organized by groups of collaborating tertiary education institutes, e.g. through the formation of NRENs, as described above. Several bandwidth consortia (actually the NRENs and umbrella organizations of multiple NRENs) from institutes in Europe and in Latin America have successfully influenced the telecommunications market and exerted political pressure at government level to reduce the cost of internet connections (Bon, 2007).

**STATE OF ICTS**

Among the eight countries examined in this study there are remarkable differences in the state of and access to ICTs. According to the Global Information Technology Report 2008–2009, Mauritius is undoubtedly at the forefront of ICT implementation in Africa, even beating South Africa. Mauritius is ranked 51st of 134 countries around the world, according to the so-called Networked Readiness Index (NRI). The Democratic Republic of Congo (DRC) is at the lower end of this spectrum and does not even appear on the index rankings. The ICT indicators for the rest show more complicated interrelationships, governed by a great variety of factors. Table 1 gives an overview of the Networked Readiness index rankings and other relevant indicators of the eight countries in 2008–09.

The state of ICTs in the eight countries is discussed briefly in the following.

**Ghana**

Ghana currently has six public universities, ten public polytechnics and up to 30 private tertiary institutions. Student enrolment increased from around 9000 in 1990 to 100,000 in 2005 (Ngugi, 2007). Ghana’s ICT policy plan focuses on 12 areas, one of which relates to education: the E-education Sub-plan. The government is committed to a programme of deployment, utilization and exploitation of ICTs within the education system.

Several Ghanaian universities already offer Bachelors courses in informatics or ICTs, although until recently not at Masters level. Some universities offer distance education, but due to the lack of network facilities, ICT tools and e-learning are hardly used.

The main bottlenecks in the deployment of ICTs at institutional level include: a lack of strategic vision; a shortage of ICT support staff and tight maintenance budgets; poor ICT staff retention; and limited collaboration among peer institutions.
The partial liberalization of the telecoms market in Ghana has reduced the cost of mobile telephony, promoting growth in this market sector, but lax enforcement of the regulations means high prices and poor service. The majority of tertiary institutions in Ghana are still connected to the internet via VSAT, which is expensive. Ghana is currently working to set up a National Research and Education Network, called GARNET, to interconnect a number of universities.

**Kenya**

Kenya has six public universities and more than 18 private universities, where around 90,000 students are currently enrolled – an increase of 50% since 2001 (Ngugi, 2007). The Kenyan government has developed the National ICT Policy for Education and Training, which focuses on promoting the integration of ICTs in tertiary education. There has been much criticism of the Kenyan government, however, for failing to involve relevant stakeholders, including representatives of private sector, civil society and the tertiary education sector itself in the process of policy development. Moreover, it appears that the ICT development plans were not accompanied by adequate budgets for their implementation.

**Table 1: Networked Readiness Index rankings.**

<table>
<thead>
<tr>
<th>NRI rank</th>
<th>Population (millions)</th>
<th>GDP per capita (US$)</th>
<th>Internet users (per 100 population)</th>
<th>Bandwidth (Mbps per 10,000 population)</th>
<th>Teledensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mauritius</td>
<td>51</td>
<td>1.3</td>
<td>5,430</td>
<td>27</td>
<td>1.5</td>
</tr>
<tr>
<td>Kenya</td>
<td>97</td>
<td>37.5</td>
<td>580</td>
<td>8</td>
<td>0.2</td>
</tr>
<tr>
<td>Ghana</td>
<td>103</td>
<td>23.5</td>
<td>510</td>
<td>2.8</td>
<td>0.2</td>
</tr>
<tr>
<td>Malawi</td>
<td>110</td>
<td>13.9</td>
<td>230</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Tanzania</td>
<td>119</td>
<td>40.4</td>
<td>350</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Uganda</td>
<td>120</td>
<td>30.9</td>
<td>300</td>
<td>6.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Mozambique</td>
<td>124</td>
<td>21.4</td>
<td>310</td>
<td>0.9</td>
<td>0</td>
</tr>
<tr>
<td>DR Congo</td>
<td>Not ranked</td>
<td>62.6</td>
<td>130</td>
<td>0.3</td>
<td>0</td>
</tr>
</tbody>
</table>

a Dutta and Mia (2009).
c ITU (2009).
d Bandwidth is measured in megabytes per second (Mbps) per 10,000 population (ITU, 2009).
e Teledensity: the number of mobile phone subscribers per 100 population (ITU, 2009).
Several institutions, such as Moi and Kenyatta Universities, offer programmes in information sciences, although they vary considerably. Kenya has a well-developed programme for distance learning education.

The telecommunications sector in Kenya was partially liberalized in 2002, but the regulatory body has so far been unable to break the monopoly on the international gateway, which has high cost and quality implications. For tertiary education, the situation is expected to improve, with the formation of a new NREN, called KENET, which is supposed to build an infrastructure and negotiate better deals.

**Malawi**

Malawi has only two public universities and one polytechnic, which enrol about 5000 students (SARUA, 2009). A recent survey indicated weak performance in terms of the quality, management and educational output of these institutions, and the poor state of facilities such as ICTs. As a consequence, the new ICT4dev policy and the National Education Sector Plan 2008–13 are focusing on strengthening the tertiary education.

Malawi has embarked on a project to form a NREN, and now has access to an existing fibre-optic infrastructure owned by ESCOM, an electricity supply company. This initiative is likely to achieve good internet connections for the universities. The success of the NREN, called MAREN, may inspire tertiary education institutes in the region to replicate this example. Malawi’s telecoms sector is now partially liberalized, and NRENs are allowed to develop their own infrastructure.

**Mauritius**

Mauritius has a diversified economy and is regarded as a middle-income country, unlike the seven other countries considered here. Mauritius has two public universities and more than 50 private tertiary institutions (SARUA, 2009), and is promoting the financial and ICT sectors and tourism as alternatives to reverse declining national export revenues. The National Strategic Plan for Education and Training 2008–20 commits massive investments in tertiary education. The private sector has invested heavily in state-of-the-art ICT infrastructure for the tertiary institutions. Curricula in information science are up to date and of high quality.

The telecoms market was partially liberalized in 2002. Mauritius has a submarine fibre-optic infrastructure connecting to Asia, Europe and Africa. The local backbone is also good, making internet connectivity of excellent quality; high demand has lowered prices, which has in turn benefited tertiary institutions considerably.

**Mozambique**

There are 26 public and private universities in Mozambique (SARUA, 2009). In contrast with many other African countries, tertiary education is even mentioned
in Mozambique’s Poverty Reduction Strategy Paper. Much has been achieved in modernizing the tertiary education sector, and in increasing enrolment.

Mozambique’s telecommunication market is partially liberalized. NRENs are allowed to own their infrastructure and international gateway. The formation of a NREN, called MoRENet, in 2006, helped in negotiations to obtain a better telecommunications infrastructure and ICT for the universities.

**Tanzania**

Tanzania has 30 universities and over 200 tertiary education institutes, where up to 68,000 students were enrolled in 2007 (Ngugi, 2007).

Through its Education and Training Sector Development Programme 2008–17, the government is committed to tertiary education and ICT development. A NREN is currently being formed, called TERNET, to connect the universities. TERNET is part of the UbuntuNet Alliance, an umbrella organization that promotes collaboration with universities in other countries.

The telecoms market in Tanzania is fully liberalized. Universities are allowed to own their infrastructure, and to purchase an international gateway to the internet. This is likely to improve connectivity considerably for tertiary education in the near future.

**Uganda**

There are 28 universities in Uganda, of which five are public, and a total student population of more than 100,000 (Kasazi, 2005). Makerere University, the oldest and largest university in Uganda, is well equipped in terms of ICT infrastructure, and as a result of strong donor support, offers courses in the sciences and information technology.

Scores of grassroots initiatives are implementing ICTs in a variety of creative ways. Liberalization of the telecoms sector has resulted in rapid growth in this sector. Uganda, a landlocked country that lacks a fibre-optic telecoms backbone, depends on satellite links.

In support of its vision of ICTs as important focal points for education and development, Makerere University established a Centre for Excellence in Computing and ICT (CIT) in 2004. CIT’s many activities include hosting an international research journal on computing and ICTs, and offering consultancy services in ICTs.

**Democratic Republic of Congo (DRC)**

DRC has five public universities and about 40 other institutes. Education has suffered considerably from the effects of the civil war that still rages. But despite all its problems, DRC is embracing the information age at its own pace.

The country still has no national internet backbone, and the telecommunications market is under a monopoly. The University of Kinshasa, with donor support, has started
a project to interconnect Congolese universities using fibre-optic links. Other ongoing ICT initiatives in the higher education sector include the creation of a virtual campus, and improving internet connectivity between academic institutions (Fall, 2007).

Many players are involved in promoting ICTs for tertiary education, from the highest political level to the institutional level. Many multilateral and bilateral organizations such as the United Nations, World Bank, UNESCO and UNDP are promoting the use and development of ICTs in higher education, while the African Union and NEPAD also support ICTs for development.

The private sector also plays a role as a provider of services and products needed for the deployment of ICTs within higher education. Especially the influence of the telecommunications markets on the availability and the quality of internet connectivity should not be underestimated.

Finally, the tertiary education sector itself is the most important stakeholder in ICT development and in the dialogue on the implementation and use of technology. Through the active involvement and participation in national and international networks of peer institutions, tertiary education institutions can increase their influence on and control of these developments.

**STRATEGIC IMPLICATIONS**

It is clear that the adoption of ICTs in tertiary education is tremendously important for modernizing teaching and learning within institutions, as well as for the creation of skilled professionals for the information society. The process of implementing ICTs in tertiary education must be given high political and institutional priority, not only for its direct benefits on the short term, but especially for the indirect medium- and long-term influences on society as a whole.

Some strategic recommendations to enhance ICTs in tertiary education and research include:

- Tertiary education institutes in Africa should be proactive in their pursuit of technological and innovative leadership. They should seriously consider themselves as innovative agents in society. Wherever possible, researchers in science and technology should link up with international collaborative research platforms, in order to enhance the use of ICTs in research and education.

- Emphasis should be given to developing ICT strategies and policies at the institutional level to improve the ICT knowledge and management infrastructure which is often inadequate to run major information systems, e-learning and online collaborative research.

- African universities should put more effort into expanding their curricula in ICTs, from a technical level to business and computer science, in order to be able to deliver the high-level graduates that their societies need.
• African countries that wish to become part of the ‘information society’ need high-quality, inexpensive internet services. Tertiary education institutions should be aware of their key role as contributors to improving internet connectivity and of their potential influence as stakeholders and consumers in market mechanisms.
• Governments should apply their legislative authority to enforce regulations, not only for mobile telecommunications, as is currently happening, but also to improve internet services.
• Universities need to address human resource problems such as capacity shortfalls and the high turnover of ICT staff, by putting in place a variety of creative measures at management, technical and operational levels.
• Development agencies need to extend their emphasis on the technical aspects of ICTs to include the managerial and educational aspects of ICT development in institutions.
• In-depth studies of the overall impact of ICTs on learning, teaching and research are needed in order to better understand its significance within specific local contexts. Greater insight and knowledge are needed to improve interventions in the area of ICT implementation, and to respond to the impacts of ICTs on learning and teaching.
• African countries should take advantage of their intellectual diasporas in order to benefit as much as possible from their knowledge and experience in the use of ICTs. ICTs play a vital role in fostering collaboration with diaspora communities and other potential partners to improve tertiary education in Africa.

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Expanding the frontiers of access: Distance and ‘privatized’ higher education

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Many African countries recognize the lack of capacity in universities to meet the growing demand for tertiary education. Distance education and, to a certain extent, the dual-track model are seen as ways to meet the demand. Distance education offers opportunities to reduce the knowledge gap between nations and to counter the brain drain. Many countries have policies and strategies for implementing distance education, but it has yet to realize its full potential. There are challenges, especially regarding the quality of education and limited resources, but it may be possible to leverage the success of a variety of delivery models to address Africa’s development needs.

Higher education institutions in Africa are increasingly expected to become centres of knowledge creation and utilization, and to promote lifelong learning. A key concern is whether African countries are adapting and shaping their higher education institutions in order to satisfy the requirements for constructing knowledge-based economies, given the numerous challenges that these institutions continue to face.

Key among these challenges is the huge demand for access to higher education. With an average enrolment in tertiary education of 5% of the population, sub-Saharan Africa has the lowest participation rate in the world. In order for African universities to contribute to the development of the knowledge society in a more meaningful way, they need to introduce cost-effective expansion strategies that will also ensure reasonable quality. ‘The inability of governments to respond to the growing demand for tertiary education poses a political problem in developing countries that have previously assumed that state provision of residential education is the only way of supplying this public good’ (Daniel et al., 2009). Considering the current shortage of residential facilities, any further expansion is beyond the means of many African countries.
THE NEED FOR EXPANSION

According to Court (1999), providing mass education or the large-scale expansion of education at the tertiary level will require significant private investment. There is thus a realization that sustainable and cost-effective solutions to the challenge of increasing access to tertiary education in Africa will require changes in the ways higher education is delivered and funded. To this end, several strategies are being employed. The two most significant include the development and/or importation of private education and the admission of fee-paying students – called the dual-track model – at public universities (Daniel et al., 2009; Johnstone, 2006). The most notable fee-paying schemes, variously known as self-sponsored, Model II, and dual-track, were pioneered in Uganda, Kenya and Tanzania (Ssebuwufu, 2003; Ishengoma, 2004; Kiamba, 2004).

Classes for private or self-financing (dual-track) students run either in parallel with those for government-financed students or separately, for example in the evening. The government of Tanzania was the first to announce a dual-track tuition policy in January 1992 for implementation at the University of Dar es Salaam (Ishengoma, 2004). In the same year, a similar policy was introduced at Makerere University in Uganda (Court, 1999), and in 1998 at the University of Nairobi in Kenya (Ssebuwufu, 2003; Kiamba, 2004). Many other African countries have achieved a significant expansion of access to public education as a result of implementing dual-track tuition policies.

In virtually all countries in Africa, there is evidence of considerable expansion of private education institutions. The introduction of tuition and other fees by public institutions – commonly referred to as the ‘privatization of public universities’ – has played a role in their expansion. In fact, there are now more private than public institutions in Africa, although enrolments at the latter are still high.

An entirely private education remains beyond the means of many students in Africa, however. Dual track or not, there is still a significant limit to the places available at public institutions. Thus low-cost public provision remains an essential and necessary approach to expanding the higher education sector. Open distance learning is now increasingly seen as key to the provision of access to affordable education to a wider student population.

This chapter reviews the significance and potential of distance learning and, to a limited extent, dual-track delivery in addressing the growing demand for higher education. It also discusses the inherent hurdles in their implementation.

DISTANCE EDUCATION

Since the establishment of the University of South Africa in 1946, the concept, nature and delivery of distance learning in Africa have undergone various changes. Many African countries have policies and strategies that recognize the importance
of distance education, although their coordination and implementation vary from country to country.

Some countries, such as Mozambique, have a national institution responsible for coordinating and implementing distance education policy. In others, national distance education programmes are implemented through either a dedicated ‘open university’ or a specialized unit within a university or government agency (Ekhaguere, 1999). More than 30 universities in Africa now offer distance education programmes (Leary and Berge, 2007).

Most national distance education programmes have emphasized teacher training (Moore and Kearsley, 2005) in response to the shortage of qualified teachers. In some cases, training programmes and colleges are affiliated with the university that awards the diplomas. Most universities use a combination of instructional methods and techniques, including learning packages, self-instructional materials, face-to-face tutorials, assignments, workshops, radio and television broadcasts and online support.

National distance education programmes have contributed significantly to increasing access to tertiary education. Distance education students now represent at least 30% of those enrolled at Makerere University in Uganda, and about half of students at both the University of Cape Coast in Ghana and at the Catholic University of Mozambique. At the University of Mauritius, 40% of their first-year modules are now available as distance education programmes. In Zimbabwe, the author witnessed how the Zimbabwe Open University grew out of the distance education unit of the Faculty of Education at the University of Zimbabwe.

Most universities offering distance education programmes tend to deliver their own courses and content, although there is a growing trend towards integration with international partner universities in Europe and the United States. The University of Mauritius, for example, offers a police studies programme in partnership with the University of Portsmouth in the UK. Such international cooperation adds quality and accreditation to the programmes, as well as providing access to financial, information and technological resources. The integration also provides African students with access to international discourses in many fields.

There is evidence of various international cooperation initiatives in many countries. For example,

- The TELESUN (TELEteaching System for Universities) project links six engineering schools and faculties in Belgium, Cameroon, France, Morocco and Tunisia, and provides internet-based courses in the engineering sciences. This is an example of a multilateral cooperation in which international discourse is being channelled to local institutions through distance education (Ekhaguere, 1999).
- In DR Congo, the Francophone University Agency and QualiLearning, a Swiss company, are promoting regional distance e-learning projects for French-speaking countries, through the provision of ‘virtual’ campuses (Fall, 2007).
• The programme, Formation à la Recherche et à la Spécialisation en Santé au Travail (FORST), which links Benin, Côte d’Ivoire and three other French-speaking African countries with McGill University in Canada and University of Lille in France, enables African students to take classes in occupational health at McGill University and the University of Lille (Beebe, 2003).

• The programme, Réseau Africain de Formation à Distance, connects teachers in Djibouti to French universities (Leary and Berge, 2007). Other regional initiatives include the Indian Ocean University project, which aims to link together higher education institutions in East Africa and southern Africa.

• The African Virtual University (AVU) is a unique international distance education initiative linking 27 sub-Saharan countries. The AVU project has experimented with various distance education technologies in order to expand access and share university-level educational content. Several internationally renowned universities, such as the Massachusetts Institute of Technology in the United States, and the Royal Melbourne Institute of Technology in Australia, have provided content in the past.

Distance education is clearly creating opportunities for students who would otherwise not be able to study. Without distance education, it will not be possible to raise the dismal enrolment rate in tertiary education.

OPPORTUNITIES AND POTENTIAL

Distance education is being used to take education beyond national borders and to help channel international discourse to Africa. Regional programmes are helping African countries to share their experiences, perspectives and aspirations for achieving their educational goals, and to address their similar development challenges. These programmes are creating opportunities for universities to develop educational technologies that are sensitive to diverse learning cultures and needs.

Distance education is helping African countries to leapfrog other countries and reduce the knowledge gap between nations. In its various forms, it is not only helping to share international discourse, but is also being used as a means to counter the brain drain by making it conceptually easier for African higher education institutions to tap into the international pool of expertise and knowledge.

With the emergence of the knowledge economy, education has shifted from being ‘education for lifetime employment’ to ‘lifelong learning’. The goals of the Education for All movement have specific requirements for meaningful lifelong learning. Because distance education makes learning possible anytime and anywhere, it is a powerful tool that supports lifelong learning. Distance education is helping to remove obstacles to enrolment for women and other marginalized groups, and to reduce cost barriers by serving large populations (Leary and Berge, 2007).
A particular opportunity to emerge from the implementation of distance education programmes is collaboration. Most important, web 2.0 tools such as wikis are making it possible for teams of subject specialists to collaborate in the development of high-quality content (Kanwar and Daniel, 2009).

In January 2004, the vice chancellors and presidents of several African universities met at Egerton University in Kenya to establish the African Council for Distance Education. The goals of this organization are to foster continental and global collaboration in open distance learning and to promote continuing education in Africa. At that meeting, the participants committed themselves to fostering continental integration as enshrined in the spirit of the New Partnership for Africa’s Development (Pityana, 2004).

CHALLENGES

Quality
Arguably, without the expansion of facilities and staff, the pressure of student numbers on physical and human resources can lead to a reduction in quality (World Bank, 2002). Indeed, many countries that experienced a doubling or tripling of tertiary enrolment and increased participation rates for young people have seen the negative effects of rapid expansion on the quality of programmes (World Bank, 2002). In order to provide the minimum quality required to attract the most able students, higher education institutions need to have high-quality personnel (academics and administrators), appropriate curricula, and adequate learning and support facilities.

There are mixed feelings about the impacts of increased access on the quality of education. The World Bank (2002), for example, noted that increased access to higher education through distance education and the dual-track model may result in a deterioration of average quality, although other authorities such as Asmal (2004) and UNESCO (2002) present a contrary view.

The most critical influence on the quality of tertiary education is perhaps the availability of learning resources, although the shortage of high-quality staff to support students is still a key issue. In addition, for most high-school graduates seeking to enter university, distance education is not their first option. This contributes further to the perception that distance education programmes are not of a high quality. Maintaining the quality of distance education is especially difficult for the dual-mode universities, because lecturers tend to put more effort into teaching resident students than into tutoring students at a distance (Daniel et al., 2009). It also poses challenges to quality assurance, accreditation and recognition of qualifications and programmes of study (African Union Commission, 2007).
Implications for research
Distance education policies in many countries are designed to complement the conventional education system. The result in most cases has been the expansion of tertiary education, which has put further strains on the already inadequate funding for higher education. This expansion has also led to competition for academic staff, especially those from the older state universities.

The reality of limited research in distance education is understandable in light of its major objective. As already pointed out, distance education in many countries is perceived as a viable complement to conventional education. The dual-track model is also highly skewed towards teaching and income generation, which seriously competes with research.

State interference
Most countries have long accepted that distance education is key to the provision of tertiary education and have introduced policies to promote it. Often, however, those policies have not been well implemented or well coordinated. In many cases, governments have tried to run distance education directly from a government department. Others have created new institutions, although in some cases they have taken too long to come to fruition because of poorly implemented policies.

Globalization
Global pressures are adding to the challenges facing African universities, which are becoming apparent in the form of increasing competition for students and qualified academic staff. Students are also better informed, and now demand much more than just a certificate.

The direct competition between public and private universities (Mabizela, 2005, 2007) is applicable to distance education programmes offered by reputable universities overseas. The qualifications, such as business degrees, offered by programmes at foreign universities are perceived to be more valuable than local ones, creating a sense that these institutions are in direct competition.

Recognition of qualifications
Traditionally, local distance education programmes have been perceived as avenues for those who have failed to make the grade, and the qualifications are therefore not respected. For this reason, programmes in a number of countries have been unsuccessful in attracting the most able school leavers. Qualifications obtained through distance education should be recognized as equivalent to those obtained from the conventional system, for the purposes of employment and further studies, in order to encourage uptake by school leavers and to remove the barriers to access. Similar sentiments are common with regard to dual-track students.
Inadequate resources
Funding for the expansion of distance education programmes is still inadequate. In many countries, the shortage of resources is aggravated by poor inter-university cooperation. Some of the reasons for this appear to be the lack of a shared vision and the poor coordination of initiatives at the national level. Customized learning materials, high levels of learner support and effective management also demand considerable resources (World Bank, 1998).

STRATEGIC IMPLICATIONS

Improving quality
Dual-track and distance education policies dictate that a university must look carefully at its internal quality assurance framework. More so, regional and international cooperation partnerships require that a university must seek ways to be part of an integrated, regional quality assurance initiative. African universities should take advantage of projects such as the African Quality Assurance Network for Higher Education, whose members seek to maintain their competitiveness by providing high-quality products.

Research output
The research output from Africa remains dismal and is not expected to improve as universities become mainly teaching institutions. Research requires financial and technical resources and motivated staff. In order to promote research, universities could use international cooperation agreements in the scope of distance education.

Universities need to systematically record their experiences in both distance and face-to-face education in order to develop a body of knowledge on best practices that will promote research in the future.

Engaging stakeholders
It is critical to secure the support of all stakeholders within a university to initiate and expand distance education programmes. In 2004, for example, the University of Nairobi held consultations and workshops to sensitize and train staff and to identify new opportunities (Kiamba, 2004). The support of participating personnel will be enhanced by ensuring that they receive a fair share of the benefits.

Competitiveness
By promising credible diplomas, national, international and overseas private and public universities are emerging as formidable competitors for the education market share of the local public and private universities engaged in revenue generation.
Institutions need to be aware of their potential so that they can specialize in areas where they are most competent, and avoid duplicating efforts. They need to be more responsive to the new kinds of education and training needed to promote economic development, the shifting demands of employers and the changing aspirations of students. Promoting global competitiveness requires strategies for tapping into the global pool of expertise and knowledge and effectively turning the brain drain into a brain gain.

New technologies
Educational technologies have made significant contributions to the expansion and consolidation of higher education in Africa. However, significant capacity problems are hampering the implementation of such technologies at both university and country levels. Universities also need to develop strategies aimed at harnessing the full potential of ICTs for distance learning, as discussed in the chapter by Anna Bon (page 59).

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Deploying Africa’s intellectual diaspora: potentials, challenges and strategies

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Africa’s intellectual diaspora represents an enormous but underutilized resource and an opportunity for African universities to connect to the global knowledge community. Many members of the diaspora are engaged in diverse academic, research, business and non-profit activities in their home countries, albeit largely on an ad hoc basis. This chapter assesses initiatives to tap the diaspora communities and explores the opportunities for African universities to deploy them to help address the many challenges they face in much more structured and effective ways. It concludes with a number of recommendations that universities, governments and development partners need to consider in their strategies to deploy their diaspora communities.

The quality of higher education and research systems in Africa has declined steadily over the years because of chronic underfunding, sustained economic and social crises, and poor governance. The lack of autonomy and academic freedom, along with dismal working environments have led many intellectuals to migrate in search of better opportunities overseas, leaving behind overcommitted, aging and increasingly less qualified faculty members. The challenges facing African universities today are numerous, complex and require substantial interventions (Teferra and Altbach, 2003). The universities have so far failed to mobilize their intellectual diaspora communities to help address these multifaceted challenges.

In recent years, a number of national, regional and international initiatives have been launched to solicit the assistance – economic, financial and intellectual – of highly qualified migrants around the world. Some programmes have attempted to encourage these migrants to return to their countries of origin, but most of them have effectively failed.
The Return of Qualified African Nationals (RQAN), for example, a programme of the International Organization for Migration (IOM), managed to relocate only around 2000 nationals in its 15 years of operation. RQAN was replaced in 2001 by a more pragmatic new programme called Migration for Development in Africa (MIDA).

Other initiatives have focused on establishing diaspora networks at various levels, by building on existing personal, institutional, governmental, non-governmental and international linkages. With the unprecedented advances in information and communication technologies (ICTs), maintaining such networks has never been easier or cheaper.

At the regional level, for example, the African Scientific Institute and UNESCO organized a conference in Paris in summer 2009, with the theme ‘The African Diaspora scientific community mobilization for Africa’ (Adiascom Africa). The conference explored how African scientific and technical experts, and their international colleagues and partners, could help to address development issues in Africa (Adiascom, 2009).

At the national level, countries including Ethiopia, Kenya and Senegal have established their own diaspora organizations to promote national development. The Kenya Diaspora Network, for example, aims to align the resources and knowledge of Kenyan diaspora organizations with the government’s economic recovery plan and with the donors’ country assistance plans. The network was formed in 2004 at the request of the Kenyan government, the World Bank Institute and the Western Hemisphere African Diaspora Network (WHADN), as an initiative of the African Union.

Senegal has established a new Ministry for Diaspora Affairs, headed by a former member of the diaspora. Ethiopia has two diaspora-related offices: one at the Ministry of Foreign Affairs and the other at the Ministry of Capacity Building. The South African Network of Skills Abroad (SANSA) was established to link highly skilled South Africans living overseas. In Nigeria, the National Universities Commission established the Nigerian Experts and Academics in the Diaspora Scheme (NEADS) to encourage Nigerian academics overseas to spend some time at Nigerian universities (Jibril and Obaje, 2008).

Intellectual diaspora initiatives are diverse, and may be formal or informal. Members of the Association of Nigerian Physicians in the Americas (ANPA), for instance, regularly return to Nigeria to offer assistance to patients and doctors (NigerianDiaspora.com, 2010). The Malawian Initiative for National Development (MIND) invites Malawians living in the UK to participate in national development by sending them home on volunteering assignments in the education and health sectors (Nyasa Times, 2009). An Ethiopian diaspora group based in North America, known as the Association for Higher Education and Development (AHEAD), was established ‘to explore, solicit, acquire and deliver educational materials that help advance education in Ethiopian universities and colleges’ (AHEAD, 2010).
The potential of the diaspora to contribute to the development of the continent has been recognized in a number of official documents. Article 3 of the African Union (AU) Charter commits members to ‘invite and encourage the full participation of the African diaspora, as an important part of the continent, in the building of the African Union’. The New Partnership for Africa’s Development (NEPAD) acknowledges the crucial contribution of remittances and the potential for increasing investment in Africa, while the United Nations Economic Commission for Africa (UNECA) has co-opted representatives of the diaspora onto its advisory committees.

Despite such visible, symbolic overtures to diaspora members, some commentators remain sceptical about whether they go beyond the desire of African political elites simply to access their financial resources (Ostergaard-Nielsen, 2001). Henry and Mohan (2003) observe that although attempts have been made to encourage successful migrants to return, there is little evidence of any desire among political elites to encourage them to contribute to African society in other ways.

While in many cases such an observation may be justified, for reasons discussed later, blanket criticism is likely to suffocate not only dialogue but also the numerous academic, scholarly and technical initiatives to involve the diaspora that are currently under way.

OPPORTUNITIES AND POTENTIAL

The tremendous potential of diaspora communities to contribute to the development of their countries of origin has been unequivocally established. Chinese, Indian and Taiwanese entrepreneurs working in Silicon Valley in the United States have been the prime forces behind the creation of innovation-based enterprises in the software and electronics sector in their home countries. These migrants have played a crucial role in linking their home country institutions with those in the United States and elsewhere. Considerable lessons can be drawn from these experiences.

The potential of intellectual diaspora networks to promote higher learning, research and innovation in Africa can be gauged from the impressive statistics on the numbers of African university professors, researchers, engineers, medical doctors, accountants and high-level technicians employed around the world. It is estimated that one in two African immigrants working in the United States holds a college diploma. In Canada, over 270 South Africans are practising as family physicians, as well as about 100 medical specialists in just one province. It is estimated that there are more Ethiopian, Ghanaian and Nigerian medical doctors working in the United States and Europe than in their own countries (Teferra, 2004b).

The intellectual diaspora could become a powerful force in linking their host institutions at the centre of the knowledge economy with the often marginal institutions in their home countries, by transferring new technologies and helping
to bridge the knowledge divide. This can be achieved in various ways, as described in the following.

**Joint research programmes**
Academic exchange schemes and joint research programmes are important aspects of academic culture, and can help to create a critical mass of researchers in Africa through which ‘invisible colleges’ can thrive (Crane, 1972). Such programmes between the developing and developed world are currently limited, but diaspora members could play an important role in expanding their potential.

**Contributions to publications**
Intellectual migrants could help boost the status of local and regional scholarly publications by contributing research articles, academic reviews and opinion pieces. Such articles can help enhance the reputation of such publications, which are often affected by a host of problems including a shortage of publishable papers. For their part, the publishers of local and regional journals could improve their credibility by inviting diaspora members to join their editorial and advisory boards.

**Sharing knowledge resources**
Many African institutions do not have access to current and relevant journals and other printed and online resources. Funds for journal subscriptions have dried up and existing subscriptions are maintained only with external support. Diaspora members could serve as vital information hubs and contact points in locating, collecting and sending information to fellow scientists at home, who often bemoan the lack of such resources. Recent advances in ICTs have made such communications much easier, faster and cheaper.

**Professional guidance and advice**
Diaspora members could be invited to assist academic staff at institutions in their home countries, perhaps by providing professional guidance and technical advice, as well as access to their expertise, intellectual networks and contacts, and other resources. This would also give them opportunities to interact with fellow scholars in their home country institutions. Already, some host countries are seriously exploring ways to expand their graduate programmes and to deploy diaspora members as advisors, consultants and lecturers.

**Endowment programmes and chairs**
Academic institutions in the United States have numerous endowment programmes and chairs that provide the holders with opportunities to pursue their academic and intellectual interests. Such initiatives are uncommon in the developing world,
with only a handful in Africa. African universities could invite diaspora members to participate in such schemes, perhaps by sponsoring endowment programmes, chairs or even outstanding students. Such initiatives would inspire not only colleagues in their host countries, but would also bring members of the diaspora closer to home.

Other ways in which universities could explore the potential of the diaspora include organizing sabbatical visits, sponsoring selected departments and running events such as conferences and workshops. They could also be invited to mentor and advise students, and to participate in distance/virtual education courses and other academic activities such as serving on editorial committees, fundraising and networking.

On the whole, diaspora members are keen to engage in academic and research initiatives in their home countries. Most of them appreciate opportunities that keep them close to home on issues of professional interest, as well as the recognition that comes with being involved in addressing national issues.

Needless to say, however, their decision to contribute to such activities may not always be driven by altruistic motives. In many areas of research and development in the region they enjoy a competitive edge that could potentially translate into research grants, publications and consultancies. Nevertheless, the confluence of personal interest, national duty (to their home country) and national pride are vital ingredients in intensifying their impact.

The extent of diaspora contributions and engagement could be further enhanced by drawing on (pre)existing relationships. Partnerships – research cooperation and collaboration – could be easily established between researchers at local institutions and diaspora members if they already interact in some way, personal or otherwise.

Higher education in Africa is increasingly attracting interest at the global level. As Northern institutions and organizations seriously consider engaging with African institutions, they will often find that diaspora members are the main interlocutors in establishing such partnerships. Many Northern institutions are slowly recognizing the value of their foreign-born intellectuals in expanding their reach within a region, and are committing their own resources, while some grant-making bodies are funding institutions that are willing to engage diaspora members in such partnerships.

Efforts are now under way to establish and consolidate centres of excellence in Africa that will be able to address the serious gaps in knowledge generation and intellectual capacity in the region. Although diaspora communities both within Africa and overseas are expected to participate, their likely contributions are not yet clear.

**THE CHALLENGES**
The experiences of China, India, Taiwan and South Korea have highlighted the tremendous potential of intellectual diasporas to help build up enterprises and
institutions in their home countries. But the opportunities for African countries to do the same are complicated by infrastructural, logistical, economic and political challenges. In order to tap the full potential of diaspora communities in the process of nation-building in their home countries, several important questions need to be addressed first.

- How can the intellectual diasporas, which tend to be amorphous and unorganized, be effectively mobilized to ensure meaningful contributions and impacts?
- What is the extent and scope of the intellectual capital represented by specific diaspora groups?
- What is the extent and scope of the interactions between diaspora communities and their host countries?
- To what extent are African governments seriously committed to engaging their diasporas, who are often their fiercest critics? Conversely, how willing are diaspora members to cooperate with the governments that many allege forced them, directly or indirectly, into exile?
- What mechanisms are already in place to mobilize diaspora communities, in both their home and host countries?
- To what extent are the academic communities in Africa interested in cooperating and willing to engage with the diaspora?
- Are the social, cultural, academic and economic environments in the host and home countries sufficiently compatible to allow meaningful cooperation? Are relevant and practical policies, infrastructures and resources in place to ensure effective engagement of diaspora communities?
- What logistical and technical constraints could potentially undermine efforts to mobilize the diaspora? What strategies need to be put in place in order to circumvent them?

THE PLAYERS

There is increasing interest in gauging the extent of financial, political, intellectual and technical capital of the larger migrant and diaspora communities. Despite the recent economic and financial crises that led to a significant decline in remittances, international organizations such as the World Bank are keen to tap the financial muscle of migrants and the diaspora as a whole.

Regional initiatives and institutions such as the African Union and NEPAD are seriously considering the intellectual African diaspora as development partners. As part of its new programme, Migration for Development in Africa, the IOM has established national diaspora coordination offices in many African countries, although so far the results have been mixed. Efforts are also being made to set up an exhaustive database to map the locations of African intellectual diaspora communities overseas.
There is a direct correlation between interest in tracking the financial and economic potential of the diaspora and harnessing their intellectual capital. The World Bank, for instance, in a recent report on African higher education, commented on the potential contribution of the intellectual diaspora to strengthen the region’s institutions: ‘The option to migrate provides incentives to acquire specialized education, and the expanding diasporas of knowledge workers from Africa are a potential reservoir of talent and entrepreneurship that some countries are beginning to tap’ (World Bank, 2008: xxiv).

Some diaspora communities themselves are also pressing potential funders to provide support. The African Diaspora Alliance for International Development (ADAID), for example, argues that the UK needs to help diaspora organizations in the same way it assists other agencies involved in development work in Africa (African Business, 2009).

In recognition of the increasing significance of the intellectual power of diaspora communities and their internal dynamics, some development partners have already launched initiatives to mobilize them, albeit in a limited way. In the United States, for instance, the Fulbright Fellowship Program is encouraging diaspora Africans to participate in its schemes. In 2003, French officials stated that African countries within France’s ‘priority solidarity’ zone, such as Senegal, Mali and Benin, were likely to be the first to benefit from its support for scientific diasporas. They also noted that such support would not substitute for French development policy to support the emergence of internationally integrated scientific communities in those countries (Goodman, 2003).

Efforts to mobilize intellectual diaspora communities are numerous and diverse. Individual- and group-based efforts are well under way, making full use of the unprecedented developments made possible by ICTs. There are now hundreds, if not thousands, of Yahoo! or Google-based virtual groups in cyberspace, for example.

In recognition of what has taken place and also future opportunities for tapping the intellectual diaspora, development partners, national governments and international organizations are now gearing up to explore and exploit them more widely. Some Northern universities are even encouraging their African faculty members to expand their international portfolios by providing resources and time off.

PREPARING FOR THE FUTURE

Individuals, groups, NGOs, universities, governments and international organizations are actively engaged in mobilizing the African intellectual diaspora to address the continent’s chronic development challenges. These efforts are now playing an important role in revitalizing the African higher education landscape.
The argument for mobilizing African diasporas goes beyond their availability and willingness to address these challenges. As diaspora members live and work at the ‘centre’ of the knowledge economy, attracting their expertise for institution building at the ‘periphery’ (Altbach, 1987) would play a positive role in expanding the global knowledge domain in general and help narrow the existing knowledge gap in particular.

In a globalizing world, deploying diaspora communities – who understand the languages on both sides of the knowledge divide – could help raise the ‘competitive’ edge of these vital interlocutors in the global knowledge landscape. Therefore, the ability of the intellectual diaspora to serve as conduits for knowledge dissemination (and creation), and their insider knowledge, sets them apart from similar intellectuals who engage with the region’s intelligentsia on various issues.

It is equally important to stress that for universities, engaging their diaspora networks will not be without problems. Important issues such as non-binding commitments, the underlying ‘institutional ecology’, technical and logistical problems, the perceptions of research and academic communities, and social, cultural, economic and political environments, can both enhance as well as constrain efforts to mobilize the talents, resources and networks of migrants (Teferra, 2004b).

African national and regional institutions need to establish close working relationships with intellectual migrants in order to reinvigorate higher education systems and strengthen learning and research. Professional networks linking intellectuals in their home and host countries are often fragmented and informal. Supporting, guiding and strategically organizing these efforts are important if institutions are to effectively deploy the massive intellectual power in foreign lands (Teferra, 2008).

Clearly, no effort to tap the intellectual diaspora – by encouraging ‘brain circulation’ – can compensate for the huge intellectual and academic deficit caused by the exodus of the African intelligentsia – the brain drain. The intellectual diaspora can only serve as vital supplements to reinvigorate the intellectual capital of African institutions. These institutions and countries should therefore focus on ensuring that their intellectuals do not leave in the first place, by improving compensation packages (salaries and benefits), working environments (in offices and laboratories) and academic freedom.

Yet it is becoming clear that trends in migration are changing in a positive direction. At a recent meeting, African university leaders agreed that the exodus of academic staff has slowed over the years, as a result of changes in compensation packages, as well as some improvements in working and academic environments. Some noted that academics are now tending to work overseas on a temporary basis – although this varies according to country, field of study, and the position and age of the staff, among other factors. These are encouraging signs for a region confronted with the chronic effects of the brain drain.
STRATEGIC RECOMMENDATIONS
The forces that trigger the migration of intellectuals are often diverse, complex and dynamic. But the factors that motivate second-generation diaspora intellectuals (children born to recent migrants) compound these dynamics even further. Strategies intended to tap this trend should therefore be as multifaceted as they are multidimensional.

Here are some recommendations that African universities, national governments and development partners could consider in their strategies to engage their intellectual diaspora communities.

Universities
• It is vital that universities establish and expand the capacity of their external relations departments to include diaspora coordination units with dedicated staff. Leaders and administrators of relevant institutions need to develop schedules suitable for diaspora members.
• Intellectual diaspora communities need to be deployed using both bottom-up and top-down approaches, i.e. from the lower levels of institutions to government ministries and development partners. It is vital to identify a small cadre of faculty and researchers at home institutions who are already working with diaspora members. Existing partnerships could serve as nuclei for growing such initiatives into viable organisms. Nurturing such partnerships organically, through local champions, for example, could help to prevent the resentment that diaspora members frequently encounter when they return home.
• Business, economic and financial events that attract diaspora communities are rapidly becoming much bigger and often bolder than academic meetings. By piggybacking on these events, universities could cut costs and take advantage of the wide range of networking opportunities they offer.

Governments and institutions
• Systematic studies need to be undertaken to develop viable policies to mobilize the intellectual diaspora and integrate them with the development agendas of respective countries. Conferences and meetings need to be organized to bring together major stakeholders – diaspora members, university leaders, government officials, faculty and researchers, development partners and think tanks – to exchange ideas and the lessons of experiences in mobilizing skilled migrants overseas. Such forums could also be helpful in formulating appropriate policies and reviewing ways to remove administrative and bureaucratic road blocks.
• Governments need to play a more proactive role in developing relevant policies and launching actions to attract and tap the expertise of diaspora members, not just those in business and finance, but also those in the knowledge domain.
less attractive environments, universities need to work the system in order to ensure that the intellectual diasporas are able to contribute to their institutions.

- African embassies, consulates and government representatives overseas could become more actively involved in mobilizing their diaspora communities. They could provide reliable information and advice on areas of research, teaching and innovative support. Embassies could foster interactions and cooperation, although this could be somewhat tricky for countries with deeply unpopular regimes whose diasporas are visible and vocal in their opposition.

- Officially recognizing the contributions of members of the intellectual diaspora would have several advantages. First, it would encourage those already involved in such efforts to contribute more personally and collectively. Second, it would encourage others to follow suit, potentially creating a snowball effect.

- Developing a systematic database of diaspora members, including details such as their institutional affiliations, fields of study or specialization, and host countries is paramount. Such a database could serve as a clearinghouse for matching up the skills and expertise available abroad and the needs of African institutions. Some is already available on the web.

- All of those involved in efforts to mobilize the intellectual diaspora should take advantage of online communication tools. Government officials and university administrators may need some guidance and technical support on the capabilities and possibilities of technological developments.

**Development partners**

- International development partners need to develop new funding modalities to explore, enable and enhance the contributions that diaspora communities have made to their home countries. Identifying and coordinating such initiatives will need considerable resources in terms of time, energy and finance. Diaspora members need to have access to resources of development organizations in order to participate effectively in such efforts. Although some development partners are already making pledges to engage the diaspora, these need to be pursued in a more organized, systematic and visible manner.

- African institutions and diaspora communities need to work together to develop programmes, policies and guidelines with a sense of shared and equal, but different, responsibilities. The interactions between intellectuals at home and overseas need to be carefully managed. Development partners could play a positive role in facilitating the creation of an environment that is conducive to making such collaboration a reality.
Notes
1 During a roundtable discussion at the seminar ‘African universities develop strategies addressing the challenges of globalization’, held in Maastricht, the Netherlands, May 2009.

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Migration for Development in Africa (MIDA): www.iom.int/jahia/Jahia/mida-africa
NigerianDiaspora.com: www.nigeriandiaspora.com/diaspora.htm
South African Network of Skills Abroad (SANSA): http://sansa.nrf.ac.za/
This chapter presents the findings of an external evaluation of the project ‘African universities develop strategies addressing the implications of globalization’. The purposes of the evaluation were to assess the extent to which the expected results have been achieved (using verifiable indicators of the logical framework), and to identify the lessons from the project as a collective learning and networking experience.

Globalization describes the process by which regional economies, societies and cultures are becoming increasingly integrated through global networks of communication, transportation and trade. Universities and other higher education institutions around the world are now grappling with a variety of challenges brought about by globalization, albeit at different levels. How to address the impacts of globalization is not simply a concern for universities in poor countries. As David Pilsbury of the World University Network recently observed, ‘Universities are universal and increasingly international, but they are not yet “global”. In a world that is globalizing rapidly, in which the central role of universities in the knowledge economy and in civil society is articulated more strongly and more widely than ever, we do not have a clear sense of what it takes or what it means to be a global university’ (Pilsbury, 2007).

The objective of this project is to enable African universities ‘to develop and adopt strategies with the aim to deliver graduates who are well equipped to tap global knowledge resources and to apply what they have learned in support of local and regional development’ (project document). The envisaged outcome of the project is that these universities will be able to position and organize themselves so as to train graduates who are able to ‘to scan globally and reinvent locally’ by drawing from global knowledge resources in such a way that they are able to integrate such knowledge in the search for solutions to local and regional socio-economic problems.
PROJECT PARTICIPANTS

The project has involved eight universities in African countries, all members of the African, Caribbean and Pacific (ACP) Group of States:

- Democratic Republic of Congo – University of Kisangani
- Ghana – University of Cape Coast
- Kenya – Moi University
- Malawi – University of Malawi
- Mauritius – University of Mauritius
- Mozambique – Catholic University of Mozambique
- Tanzania – University of Dar-es-Salaam
- Uganda – Makerere University

All the African participants maintain partnership relationships with one or more members of the Educational Cooperation with Developing Countries (EDC), one of the professional sections of the European Association for International Education (EAIE). EDC members are involved in all aspects of educational cooperation, ranging from policy development and information dissemination to liaison work, project development, implementation and management, and student advice.

The original European participants included Maastricht University (the Netherlands), the University of Antwerp (Belgium) and the University of Twente (the Netherlands), although in the end, the latter did not participate in the project as a result of changes in staff.

The African participants represent a diverse collection of institutions, with huge disparities in terms of their age (the University of Dar-es-Salaam was established in 1961; the Catholic University of Mozambique in 1996) and sources of funding. All but one of the participating institutions receive state funding for more than 90% of their budget (the Catholic University of Mozambique is a private university with no state subsidy). They are also located in countries with different levels of economic development, measured in terms of GDP per capita (Mauritius $5430; Ghana $510; DR Congo $130) and internet penetration (Mauritius 27%, Kenya 8%, Ghana 2.8%, Mozambique 0.9%).

These differences have implications for the size of the universities, as well as their staffing levels, real assets, ICT infrastructure, internet connectivity, the range of programmes offered, governance traditions and institutional culture. Since each institution has specific problems and unique needs, the project does not pretend to offer a ‘one size fits all’ solution to all challenges. Rather, it seeks to support African universities in identifying the common systemic challenges posed by globalization, and to help them develop both specific and generic approaches to deal with them.
THE PROJECT: PROCESS AND METHODS
The first step of the project consisted of an institutional self-assessment exercise spearheaded by the team leader at each participating university. The self-assessment exercise was based on a pro-forma guide provided by the programme managers, and took the form of a SWOT analysis that examined each institution’s
- strengths (e.g. ICT infrastructure, internet connectivity, ICT policy framework);
- weaknesses (e.g. limited or obsolete ICT infrastructure, shortage of ICT professionals, inadequate ICT budget);
- opportunities (e.g. political acknowledgement of university's critical role in development, academic and research networks, government funding, donor funding); and
- threats (e.g. inadequate and costly ICT connectivity and expertise, tight government control, lack of academic freedom).

The second step was a three-day (inception) seminar held in Maastricht, the Netherlands, in May 2009, where the university leaders were briefed by a team of six experts on topics relevant to higher education, and discussed strategies for responding effectively to the globalization of knowledge. In their presentations the experts discussed the primacy of the knowledge economy in the modern world, and how African universities should respond. They stressed that the universities need well-managed and well-resourced ICT infrastructures if they are to contribute to local and regional socio-economic development. But they also acknowledged the formidable difficulties, and proposed ways to overcome them. Other presentations discussed quality assurance in higher education and the challenges involved in engaging the African diaspora in transforming the brain drain into a brain gain.

In the third step, each university embarked on an internal consultation process with relevant stakeholders with the purpose of producing a draft strategic plan to address the challenges posed by globalization. The participants posted their draft strategy papers on the D-group platform for critique, feedback and revision, and discussed them by email and online. They then submitted the documents for adoption by the relevant governance structures at their university.

Finally, at a second three-day (consolidation) seminar held in Mangochi, Malawi, in April 2010, the university leaders presented their draft strategy papers for discussion, and explored possible synergies and opportunities for collaboration.

REVIEW OF THE PROJECT
This section examines the components underpinning the logical framework for compliance.

In terms of the logical framework, the specific objective of the project is for the ‘eight African universities to develop and adopt strategies with the aim of positioning
and organizing themselves in order to deliver graduates who are well equipped to
tap into global knowledge resources and to apply what they have learned in support
of local and regional development’.

The verifiable outcome measures are that each of the eight universities develops
and adopts a strategic plan in the context of the specific objective.

Comment: This objective is valid, urgent and timely. ‘Today, possessing knowledge
and having the ability to collect such knowledge from worldwide sources is critical to
personal and societal advancement. Likewise, having a skilled and globally focused
workforce is perhaps the most important ingredient to any organization’s or nation’s
competitiveness in a world where competitors can come from next door or around
the world’ (Wood, cited by Tomlin, 2009).

This objective has been substantially met. Each of the eight universities produced
a strategy paper that in most cases was the product of the inputs, deliberation and
consultation among the appropriate institutional stakeholders.

The project did not require that participants assess the cost of achieving their
strategic objectives. This opens the opportunity for strategic papers to become wish-
lists bearing no relation to what can realistically expected in the context of the
institution’s budget.

In a later section, I comment on the content and quality of these strategies, and on
whether and how well they adequately conform to the specific objective noted above.

In most universities based on the Anglo-Saxon model, the ultimate authority for
approving strategy proposals with financial implications is the governing council,
and it would be very unusual practice for council minutes to be released to third
parties. Although the logical framework calls for such minutes to be submitted
as verification indicators, I have not personally seen them, but I am reasonably
satisfied, based on my experience as a former university chief executive, and on the
presentations, that the strategy papers submitted (except for those of the universities
of Cape Coast and Kisangani) emanated from legitimate consultation processes
within the universities. The University of Kisangani, I believe, has not yet developed
strong and established institutional procedures for this sort of exercise. The strategy
paper submitted by the University of Cape Coast was produced by just one institute,
and not the university as a whole.

Two things can be noted, however. First, some universities already have long-
established and approved institutional strategic plans. The newly drafted papers
under discussion would therefore presumably be supplementary to those plans. In
other cases, the project seems to have coincided with a period of institutional strategic
planning. Thus the process is still open to further inputs and amendments on the
basis of feedback such as that received at the Malawi seminar. Crucially, however, the
project has raised the consciousness of the universities regarding the need to plan for
globalization, and empowered them to engage in the planning process.
EXPECTED RESULTS

Expected result 1: An ‘enhanced capacity to look forward: University leaders (vice-chancellors, rectors) and their principal advisors are updated on important trends concerning global knowledge production and opportunities for and threats to research, education and development in Africa.’ The verifiable indicator would be the presentation of six papers on the implications of globalization, prepared by the team of experts, written and presented to university leaders. The useful deliberations at the Maastricht seminar and the information passed on would assist the vice-chancellors and rectors in leading the strategy discussions at their own institutions.

Comment: This result was achieved. The Maastricht seminar was convened, and six well known experts on higher education prepared and presented papers on various aspects of globalization: Olusola Oyewole (universities and the knowledge society), Fred Hayward (postgraduate education and research), Juma Shabani (regional education initiatives), Anna Bon (ICT issues in African universities), Nephas Mufutumari (distance education) and Damtew Teferra (the African diaspora). The participants reported that the seminar was both stimulating and instructive.

The follow-up discussions and sharing of ideas via the D-group platform and by email further enhanced the impact of the interactions.

Expected result 2: An ‘enhanced capacity to seize emerging opportunities; eight universities to have developed and adopted strategies and approaches with the aim of seizing the emerging opportunities for training students to acquire knowledge globally, and preparing and stimulating students to apply their globally acquired knowledge to address local and regional problems and needs’.

Comment: This result was partially achieved. The strategy papers were largely silent on the need to promote transformation in curricula or teaching methods so as to instil a more international orientation among staff and students. Most of the papers were concerned with expanding access to ICTs, and with the acquisition of an up-to-date ICT infrastructure, both of which are undoubtedly very important objectives in the African context. But they are not sufficient in and of themselves to bring about the envisaged outcomes in the quality of graduates without a concomitant transformation of the manner in which ICT-mediated knowledge is acquired. This observation is addressed in more detail in the following paragraphs.

Expected result 3: ‘Insights and ideas shared with other higher education institutions in the region’ through the publication of a report on the seminar.

Comment: At the time of this review this was a work in progress. The objective to publish a report in the form of a book based on the ideas canvassed during the project for distribution to other African universities is creditworthy as a means of
sharing insights and ideas on ways to address globalization and its impacts on higher education in Africa.

When asked for their views on the process of the project, the participants commented that the overall process was satisfactory and well paced, that communications were adequate and helpful, and that there was a good and shared understanding of what was required.

THE STRATEGY PAPERS

The draft strategy papers presented at the Malawi seminar reflected the common themes of the challenges of globalization, although the extent of these challenges varied from one institution to the next. They included:

- limited and expensive internet connectivity, obsolete or poorly maintained ICT infrastructure, shortages of qualified ICT staff, the lack of an adequate policy framework;
- inadequate institutional funding means dependence on state subsidies and donor support;
- inadequate institutional and national policies regarding ICT governance;
- difficulties in recruiting and retaining academic and technical staff because of low salaries compared with the private and NGO sector;
- adverse impacts of government policies such as the retention by the state of revenues generated by the university; in Mozambique, there was no state support for private providers of higher education;
- ballooning student numbers in the face of inadequate and obsolescent facilities; and
- competition from offshore providers of higher education courses.

The participants had put much thought and effort into producing the strategy papers presented at the Malawi seminar, and all credit is due to them and their collaborators who helped canvass institutional inputs and compiled the documents. The strategy papers were generally well structured, including a mission, a vision and a SWOT analysis, in line with a preliminary questionnaire. However, there were some gaps in the strategies that would have added more depth to the plans.

- Most plans neglected to highlight the university’s niche. What is the university about? Why does it exist, and what would happen if it disappeared? Who does it specifically serve? The Catholic University of Mozambique came off best in this regard, by tracing its history to a need for a university in the central and northern regions of the country. Moi University saw its niche as the rural university of Kenya – but did not specify how that differentiates it from other Kenyan universities in terms of programmes offered or population served.

- The strategy papers presented lacked specificity. The ideas expressed tended to be generalities, consisting of wish-lists rather than plans for action, with timeframes
and costings. In one sense, this is understandable given the budget uncertainties and unpredictability of revenues for institutions that depend almost entirely on government subsidies.

- Most plans referred to *quality assurance*, but few specified what practical steps could be taken to achieve it. Competition from offshore providers was frequently mentioned as a threat, and in some cases, despite the high fees, their qualifications were perceived as better quality and value than those offered by public institutions free of charge. The message here is that, rather than seeing offshore providers as a threat, African universities should regard them as an inspiration to improve their quality and branding.

- None of the papers referred to *autonomy*, the authority of institutional self-government, free from external interference, or *academic freedom*, allowing academics to ‘speak truth to power’. Both concepts are essential for planning. Almost all African universities (South Africa is one of the few exceptions) lack these freedoms. One senior observer of the African scene, when testifying before the World Bank/UNESCO Task Force on Higher Education and Society (2000), related how, ‘with the government in many [African] countries having assumed the power to appoint and dismiss the vice chancellor, governance in the universities has thus become a purely state-controlled system [and] heads of institutions can change with a change in government’ (World Bank, 2000).

**Internet connectivity**

It is clear from the strategy papers that internet connectivity across Africa is generally poorer and much more expensive than in the rest of the world. In her presentation to the Maastricht seminar, Anna Bon reported that in Ghana, 256 Kbps of bandwidth costs €600, compared with €20 for 2 Mbps (eight times as much), in the Netherlands. Bon suggests some reasons for this:

- internet service provision is controlled by monopolies, private or state-controlled, with no competition;
- the lack of regulations to enforce sharing of infrastructure;
- a low-volume, high-price marketing model (limited in-country connectivity leading to higher prices); and
- the lack of consumer organizations to monitor providers and lobby for customer-oriented pricing and practices.

These dismal conditions notwithstanding, some of the eight universities have come a long way in establishing a serviceable institutional ICT framework. For example:

- *The University of Mauritius* has an adequate data infrastructure, including computers, routers and scanners sufficient to respond to current demand. The ICT department has sufficient capacity, including ICT personnel with postgraduate qualifications, and is governed by clear operational policies. The university
offers access to basic and advanced ICT applications, including functional search engines, e-learning environments, wikis, shared spaces and video conferencing facilities. As far as ICTs are concerned, the strategic objectives included investing in e-learning and seeking affordable connectivity through joint action and national and regional collaboration. The university council has approved these strategic directions.

- **Makerere University** offers its students ‘modest’ internet access via an expensive satellite link – with 20 Mbps bandwidth costing US$2500. It is a member of the Ubuntu Alliance and of the Research and Education Network for Uganda (RENU, a Ugandan initiative), and hopes to gain access to the much less expensive undersea fibre-optic cable in due course. Makerere has adopted a 10-year strategic plan with three cross-cutting themes: quality assurance, internationalization and gender mainstreaming.

- **The University of Dar-es-Salaam** has a fibre-optic backbone infrastructure that offers campus-wide network access, open-source e-learning platforms, LAN in most buildings, excellent ICT leadership spearheaded by the top university leaders, universal email access for staff and students, and supportive national and institutional ICT policies. However, this otherwise admirable setup is being undermined by underfunding, obsolescence, poorly structured deployment of LANs, and other problems. The university has a strategic plan in place.

- **Moi University** has more than 1000 computers with internet access across the campus, and hotspots with wireless internet support. There are more than 15 LANs, a fibre-optic cable backbone and microwave links.

**Low online participation in Africa**

While the eight strategy papers are preoccupied with the internet, which is indeed critical to ICT-mediated knowledge transfer, the truth is that online participation in Africa remains very low. It then becomes a chicken-and-egg debate as to whether this is so because there are limited facilities, or there are limited facilities because there is limited demand. Probably both views have some truth to them. Levels of literacy in general, and ICT literacy in particular, are still very low in Africa.

Higher education institutions in South Africa clearly have the best internet connectivity in Africa. There are 11 South African and four Egyptian universities listed in the latest ‘Top Africa’ web ranking of world universities, which rates institutions based on the size and quality of their internet presence. But even South Africa features poorly in world rankings of ICT usage. In 2003, a draft white paper on e-education noted that almost 35% of people in developed countries have internet access, compared with only 6% of South Africans, and fewer than 2% in other developing countries (South Africa, 2003).
This raises the related question of *distance education*, which frequently (and correctly) comes up in the strategy papers. The University of South Africa, indisputably the largest distance education university on the continent, with more than 200,000 students enrolled, is still largely paper-based. ICTs undoubtedly play a role in distance education in Africa, but not a predominant one. That said, it is understandable that the strategies of the eight universities are mainly concerned with access to ICTs. However, achieving the specific project objective of producing graduates who will contribute to development will require more than just ICT access.

**Globalization and institutional culture**

Even though there is no single definition of the concept of institutional culture, the term is widely used to describe the personality of an institution, encompassing the attitudes, values, practices, governance and inter-campus constituency relationships that underpin its functioning. Even universities in industrialized countries, with excellent ICT infrastructures and connections, still grapple with the challenges of globalization because their prevailing institutional cultures are not sufficiently geared to embracing internationalization.

ICTs should be about transformation. Oliver (2002) points out that in such diverse fields as medicine, tourism, travel, business, law, banking, engineering and architecture, the impacts of ICTs over the past two or three decades have been enormous. The way these fields operate today is vastly different from how they did so in the past. But with regard to education, ICTs seem to have had an uncanny lack of influence, resulting in far fewer changes than in other fields.

One reason for the failure of universities to adopt a globalization-sensitive culture is that they are, by their very nature and tradition, conservative and therefore resistant to change, particularly among faculty members – professors, deans and heads of schools and departments. Meaningful ICT–globalization initiatives only get off the ground if they are accompanied by broad-based 'buy-in', beginning with the university leadership, but also including deans and department heads at specific schools, directors of centres, individual faculty members, students and the broader community-based leadership as well.

**Globalization and curriculum reform**

To train students who will be able to tap into global knowledge resources requires a corresponding change in the way they are taught to learn. This is acknowledged in the strategy paper from the Catholic University of Mozambique, which has already adopted approaches that instil student-centred learning, but not explicitly in the other seven papers.

This point is emphasized by Mok (2010): 'In order to enhance the global competence of university graduates, universities across different parts of the globe
have started comprehensive reviews of the curricula and introduced new strategies to transform university learning and teaching from the current teacher-centred to a more student-centred approach. Acknowledging the growing need to better prepare students for living and working in an increasingly culturally diverse and socially complex world, universities not only in the West but also in the East have developed new teaching and learning strategies to promote multiculturalism and internationalization of curricula. Globalization-focused transformation, according to Dale (2010), ‘is not so much the introduction of new elements to the curriculum as a container, but a reshaping and relocation of curriculum’.

With regard to this ‘reshaping and relocation’, Oliver (2002) notes that curricula must be transformed from content-centred to competency-based, requiring strategies associated with moves away from teacher-centred to student-focused forms of delivery. Contemporary learning settings, using technology-facilitated approaches, can encourage students to take responsibility for their own learning.

In most African universities, curricula are still largely teacher-centred, and any strategy for transforming them needs to go hand in hand with a strategy for enhancing ICT preparedness for teaching purposes.

**Globalization, ICTs and staff development**

University instruction traditionally revolves around a lecturer and his or her students. The lecturer teaches, and the students receive knowledge. The lecturer is deemed to be the primary source of knowledge and the students mere receptacles, with textbooks serving to supplement and reinforce what is taught in the classroom. As mentioned above, ICTs used in this way are unlikely to contribute to achieving the objectives of this project.

However, academic staff often have insufficient ICT skills themselves, and are either unable to transform their teaching styles, or are even hostile to the idea of ICTs as educational tools. It is therefore crucial that the installation or expansion of ICTs within universities are accompanied by staff development programmes to make the staff aware of how to use them effectively – not just in a technical sense, but particularly also how to integrate them into the curriculum.

**FROM ‘TALKSHOP’ TO ACTION**

The project created a space where the participating universities were able:

- to take stock, engage in internal deliberations and ponder the implications of globalization for their respective institutions;
- to learn from experts and from each other regarding the challenges and possibilities of ICTs in the African context;
- to focus on the state of their ICTs, and to develop, document, discuss and approve strategies to enable them to cope with, and benefit from, globalization;
• to ponder the wider implications of the impacts of globalization, and their level of preparedness with regard to institutional governance, funding resources, the increasing demand for higher education, the role of distance learning, issues of quality assurance and the impact of competing offshore education providers; and
• to consider forming regional collaborations and alliances as means to achieve a critical mass and economies of scale in their efforts to address the challenges of globalization

To build on these achievements, future steps will include the following:

**Institutional follow-up**
Each participating university will now work towards the endorsement and adoption by relevant stakeholder(s) of an appropriately revised version of the strategy paper. The institution will work towards the implementation of its strategic objectives, particularly regarding ICTs. This includes ensuring that there are sound and effective institutional and national ICT policies, and that the institution is a member of existing regional and national networks working for an effective, equitable, accessible and affordable ICT system and presence in the country. Each university will endeavour to identify four or five priority areas for attention in the short to medium term.

**Institutional networking**
The universities involved have agreed to form a network to move the project from talk to action. The network will put together a plan to help implement some of the objectives stated in the strategy papers, in particular with regard to:
• ICT infrastructure,
• leadership and management,
• quality assurance,
• innovative teaching and learning systems,
• research capacity,
• policy entrepreneurship
MUNDO will develop a concept paper for a fully fledged project in this regard.

It is clear that for this project to be judged successful, it will have to move beyond the ‘conferencing and deliberation stage’ to an ‘action stage’ in which material resources are invested in supporting the universities as they pursue their priorities (e.g. creating or joining networks). It should be stressed, however, that the project (or its successor) cannot reasonably be expected to fund the actual and multiple strategic objectives of the participating universities.
LESSONS LEARNED

- African universities face enormous challenges that are standing in the way of their efforts to strengthen the capacities they need both to cope with and take advantage of globalization.
- African universities are conscious of these needs and challenges, and have a clear idea of the strategies needed to overcome them.
- There is an enormous diversity among African universities in terms of what they already have, their needs, size, location, how they are funded, and so forth. There is no ‘one size fits all’ solution to all their needs.
- In considering ICT-mediated knowledge to deal with globalization, the universities must appreciate that access to the internet and ICT infrastructure are not sufficient. The institutional culture must reflect an international outlook, and curricula must be in tune with ICT-mediated learning.
- The project will need to provide material support (seed money) to the new network of African universities to enable them to pursue the generic strategic objectives unveiled during this process.

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