

Assessment of Africa's Telematics, Policy and Regulatory Infrastructure: Potential for E-learning

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By

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Abstract

Increasingly, a number of universities worldwide including some in Africa are making positive attempts to implement e-learning strategies in order to enhance equity, quality, share instruction technology resources, compete in global environment of higher education and meet the rising demand for tertiary education. The problems that bedevil Africa's tertiary education sector are compelling for the implementation of e-learning strategies. This paper examines Africa's higher education environment from the point of view of the continent's telematics status. The paper recommends policy, legal and regulatory frameworks that are necessary to create an enabling environment to harness opportunities of e-learning in order to address Africa's higher education problems.

Keywords: Higher education environment- Africa, Africa's e-learning status, e-learning regulatory frameworks, e-learning policy frameworks, e-learning legal frameworks, e-learning.

Introduction

Traditional universities including those in Africa are taking share in the global e-learning market. The

infrastructure is improved throughout Africa. E-learning in Africa is being introduced to complement distance education systems in such countries as South Africa, Tanzania, Zimbabwe, Kenya, Ghana, and Zambia where such systems have relied in the past mainly on print media (Daly, 2003).

Though the use of ICTs in education especially radio and TV is not new, the advent of the Internet and World Wide Web has transformed the education environment into a borderless sector that is now able to reach and benefit previously underserved citizens and education entrepreneurs. The use of ICTs in any form of education around the world has largely been spurred by major investments taking place in telecommunications and information systems.

University environment in Africa

When most countries in Africa emerged from colonial yoke on attainment of independence, there was heavy investment in education at all levels in order to develop adequate manpower for national development. Most

are producing graduates who are ill equipped for the world of work. Consequently employers often have to re-train staff in a time-consuming and expensive exercise. Many universities have not fully moved to implement the use of ICTs in their academic programmes. In addition brain drain and unemployment among graduates was causing concern to the local universities and governments. The lack of land for expansion and research, and duplication of programmes in public universities was quite common in Africa (Aduda, 2001).

National policies often interfered with student selection, faculty appointments, promotions and curriculum design. There is major exodus of students to foreign destinations in search of quality education. Britain, United States and Australia have become popular destinations for students from English-speaking African countries, while France continues to be the academic destination for students from Francophone Africa (East African Standard 2001).

Kenya is reported to be leading the rest of African countries as an importer of higher education from Britain and United States. Each year, Kenya sends almost 12,000 students to foreign universities of which 7000 go to India and 5000 to Europe and the United states. The Ministry of Education in Kenya estimates that the country is spending over Ksh15 billion (US\$192,307,692) a year on higher education abroad. This exodus has created perfect conditions for foreign universities to do lucrative business in education. Basically tuition fees in most foreign universities notably in UK are about double for international students. Tuition fees range from KSh675,000-700,000 (US\$8653-8974) for Bachelor of Arts (BA) to KSh875,000- Ksh900,000 (US\$11217-11538) for laboratory based courses in engineering, physica o

increased theft, wanton mutilation of books, disregard of copyright laws as photocopying has increased. In addition financial constraints have hampered acquisition of new computers, hiring additional staff and performing necessary capital improvements.

The reduction in subsidies has been quite significant. In Kenya for example student expenditure in the 1970s, was US\$6,300 and this decreased to US\$1,200 in 1995. This decrease affected the quality of teaching and research. There is deterioration in physical facilities, lack of resources for textbooks, educational materials, laboratory consumables and maintenance. An inquiry into violent student demonstrations and riots at Kenya's public universities blamed the unrest on poor living conditions. In the past 10 years, the inquiry report says, there were 60 riots of which 40 percent were linked to food and accommodation. Other problems include ineffective teaching and lack of tutorials. Students try to cut on costs by cooking in overcrowded halls resulting in frequent fires. 12,000 female students were living in mock marriages to cut down on expenses. Students brew and sold illicit alcoholic drinks to subsidize their meagre living income (Kigotho, 2001).

Universities in the region are operating in a closed shop system and were unwilling to include the private sector in the review of academic programmes. Government officials who have little understanding of the goals and capabilities of a university approve budgets. More than 80 per cent of the funding is spent on personnel and student costs leaving little for building maintenance or research. At Fort Hare University in South Africa, there was reported drop in the number of students from 5208 in 1995 to 2869 in 1999, which hit its income. This led partly to the current ongoing merger of the University with other institutions in the neighborhood (Jobbins, 2001). The University of the Northwest also has in the past suffered financial instability that almost threatened university closure

Women constitute the majority of people in the region but their representation in universities as students, lecturers or administrators was lower than that of men. Statistics indicated that females make up 34 per cent, 22 and 12 of primary, secondary and tertiary students respectively (Waihenya and Siringi, 2001). The quality of research produced in universities of the region has been declining. This has partly been attributed to lack of access to books, current journals, and other materials (Thiam, 1992.)

The African Leadership Centre (ALC) is a non-profit organization established in 1999 to provide leadership training for African leaders. It is based in Washington, DC and has a network of offices in Africa, Asia, and Europe. The ALC is a 501(c)(3) organization and is registered in the United States. It is a member of the International Leadership Association (ILA) and the International Association of Executive and Leadership Coaching (IAELC). The ALC is a 501(c)(3) organization and is registered in the United States. It is a member of the International Leadership Association (ILA) and the International Association of Executive and Leadership Coaching (IAELC).

Africa's higher education environment is largely mired in complex challenges. The continent has between 11 percent –13 percent of the world's population, yet the region is reported to receive only 1 percent of global expenditure on education. Comparatively, the developed world where 21 percent of the world's population live, they are reported to receive 84 percent. Forty million children of school going age in Sub-Saharan Africa do not attend school. Less than one third progress to secondary education and only 3percent receive any form of tertiary education. In comparison in the developed world 15-17 year old nearly 100 percent receive secondary education and more than 50 percent tertiary education. A child in Sub-Saharan Africa has on average USD49 per year spent on his education as compared to USD 4636 on average for the a child in the West (Johnson, 2001).

Universal access to education has been elusive to many countries of Sub-Saharan Africa. In South Africa schooling is compulsory for ages 7-15, but while about 1.3 million enter the gates of school in grade one every year 570,000 make it to grade 12. South Africa has about 12 million learners, 8 million in primary and 4 in secondary schools. At universities 1 in 3 drops out. The other problem is lack of accessibility to school by disabled children. It is estimated that 280,000 disabled school going children in South Africa are not going to school for various reasons including lack of transport and insufficient schools which are estimated at 380 (Ludski, 2001)

Globally, the rate of scientific publications has grown phenomenally in the past two decades, but a recent ranking of the publications per capita did not include single country in Africa among the top 15. The rapid and chaotic expansion of university education has created problems to public universities (Waihenya, and Siringi, 2001). Despite increase in use of ICTs there is heavy usage of traditional means of communications such as fax, telex and telephone instead of exploiting the cheaper Internet. Despite the availability of the Internet, most of the Universities in the region have very limited access to modern computing and communications technology

Intervention measures by universities in Africa

The budgets cuts in most universities in recent years in Africa and other economic, social and political problems have occasioned attempts by these institutions at implementing various strategies that are market oriented (Kenya Republic of, 1993; Maina, 1989). Some universities have put in place a wide range of programmes to generate own income to augment the dwindling allocation from national governments. Other universities have expanded programmes to cater for wider audience through various programmes such as distance education, introduction of parallel degree programmes, introduction of part-time programmes, establishment of internet service provision, etc. The recent and increasing implementation of e-learning initiatives is another new strategy that would take advantage of the Internet and Worldwide Web to add on the array of ammunitions at the disposal of universities to respond to challenges that are facing them.

Other survival measures that universities have adopted include retrenchments, freezing on recruitment like at the University of Zimbabwe, introduction of cost-sharing measures where students are paying for their tuition and meals like in Kenyan universities. Similarly some universities have implemented marketing services to industry to raise income as is the reported case at Vaal Triangle Technikon in South Africa where the institution is marketing its library services to industry (Borephe, 2000). Additionally, governments in the region are encouraging universities to join hands with the private sector in the development and management of the higher education sector. In Kenya through a recent bill known as the universities amendment bill the government has liberalised the provision of university education to expand higher education opportunities because many eligible students are not all absorbed in the local public universities. This measure is expected to make provisions for the establishment of more foreign universities and distance education programmes locally. It is hoped that this will absorb most of students who qualify but do not gain admission to the universities. Today only 40 percent of students who qualify in Kenya get admission to the local public and private universities (Kikechi, 2001).

Public universities in Kenya are generating income through various programmes and arrangements. The Medical School morgue at Chiromo Campus of the University of Nairobi has been opened to public use. The universities are also generating addition income through production of crops and rearing dairy and beef cattle on their farms. The universities have also introduced parallel degree programmes (part-time programmes) for those who could not secure admissions to the universities in the first instance and those in full time employment. Students admitted on parallel degree programmes are charged fee that is twice as much compared to the regular students. However, parallel programmes have raised opposition from regular students who complain that those admitted to the programmes did not meet same university entry requirements as themselves and that the rich were competing with the poor for the meagre university resources.

University of Cape Town are some of the institutions offering distance learning through the Internet. This innovation is making it possible for the universities to generate additional income to augment dwindling government allocation.

Rationale for e-learning initiatives in tertiary institutions

More than ever before problems facing universities in Africa are compelling for the implementation of e-learning strategies. Globally, most higher education institutions have historically operated in a heavily regulated and protected market with only limited pressures for competitions, efficiency and innovation. It is now clear that advance and penetration of market forces into the traditionally vulnerable higher education market is becoming inevitable. Higher education institutions in Africa and elsewhere now need the capacity to compete and deal effectively with market forces through various innovative ways. E-learning presents an open and flexible learning opportunity which enable mature students and those in employment to access education programmes.

E-learning provides a cost-effective way of providing education and preparing students to participate in global information society. Increasingly, there is growing demand placed on education systems by public, government, donor agencies and other stakeholders to reform. With limited resources especially in Africa, the need to access universities in other countries via e-learning infrastructure is gaining popularity because this is a cheaper means than building university infrastructure. Africa would do fine with e-learning to overcome the high cost of providing technical education. E-learning systems would also provide higher educational opportunities that are limited in Africa. Through e-learning, educational opportunities are being expanded in addition to overcoming the barriers of time and space. E-learning programmes are being implemented to achieve quality education through access to adequate learning resources elsewhere.

Potential of e-learning systems for Africa

Various developments are taking place both globally and within Africa that would make the wide implementation of e-learning opportunities by tertiary institutions possible and real. The Digital Opportunity Task Force (DOT Force) of the G8 is an elaborate effort to bridge the digital divide globally. The DOT Force has made a wide range of recommendations as a framework for bridging the digital divide which include among others the need for fostering policy, regulatory and network readiness; improving connectivity, increasing access and lowering costs; building human capacity; encouraging participation in global e-commerce and other e-networks (DOT Force, 2001).

There are various national initiatives on the continent. For example, the South African government is establishing multipurpose community centres across the country as part of its e-government strategy. The government has started the process of installation of computers in post offices across the country to help the poor and the illiterate to access

information through desktop kiosks (Ngobeni Wa, 2001). Additionally, the New Economic Partnership for Africa, NEPAD among other things aims at improving infrastructure. It is hoped that NEPAD will give impetus to foreign inflows of capital for infrastructure development. On the other hand Translate.org.za a South African based NGO has made good progress to translate computer applications in local languages in order to overcome language barrier in using computers. So far the computer applications covering the full desktop, web browser, word processor, spreadsheet and email have been translated into some local languages such as Xhosa, Zulu and Venda (Martindale, 2001; Translate.org, 2002).

Within South Africa, UNINET provides Internet backbone that supports students and staff at 21 Universities and 15 Technikons as well as universities in Lesotho, Swaziland and Tanzania. It also provides links to 400 schools that now have connectivity to the Internet. In Kenya UUNET Multinational Service Provider is planning to provide free cyber cafe services to selected rural based colleges and secondary schools as a social responsibility if the government licenses the use of VSAT. This would help students to carry out research through Internet besides giving them an opportunity to easily communicate with the rest of the world

Several countries in Sub-Saharan Africa are liberalising and privatising their telecommunications systems and effectively reducing tariffs. South Africa, Namibia, Botswana, Kenya, Malawi, Nigeria, Angola, Mozambique and Zambia are some of the countries that are undertaking privatisation process or have plans underway. This development is enhancing the uptake

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Through the aegis of Economic Commission for Africa, a High-Level Working Group of information technology experts was formed to draft an action framework to utilise the information and communications technologies to accelerate the socio-economic development of Africa and its people. The action framework calls for: implementation of national information and communication infrastructure; building institutional frameworks; human, information and technological resources in all African countries; pursuit of priority strategies, programmes and projects for the sustainable information society in African countries (Amoako, 1996).

The forthcoming World Summit on Information Society in December 2003 in Geneva to which most countries are committed has the basic principles of building of information infrastructure through telecommunication and investment in technology; opening gates by achieving universal and equitable access to information technology; meeting needs of the developing world, and making information a common good (ITWeb, 2002: United Nations, 2002)

Challenges of implementing e-learning systems in Africa

Though the prospects for the implementation of e-learning initiatives in Africa look good, there are a number of challenges that need to be addressed. In Africa's higher education, the information infrastructure is poorly positioned compared with counterparts in Europe and America. Computers are relatively scarce in these institutions and those that are available are often in state of disrepair with limited connectivity as a result of universities own lack of connectivity and that of the large communications networks (Daly, 2003). Challenges that would need to be addressed include the inadequate accessibility of ICTs by students, cost related problems, appropriateness of the ICTs to the teaching and learning process, the user friendliness of ICTs, and speed of delivery systems. In most countries there seem to be lack of government policies about role of e-learning in education and training. The evidence of this can be found in education policies and strategies which are largely weak and ambiguous about the role of ICTs in education. Other problems relate to technophobia, lack of prerequisite skills to manipulate new technology, and personnel reluctance to switch from traditional methods of teaching to technology oriented approaches. The implementation of e-learning programs requires skills in content development to repackage existing programmes and also design novel ones.

Today, Africa is behind other continents of the world in technology development. Fewer than one in 100 people in Africa have access to the Internet. Despite advancing into ICT sector 40 percent of the population is under constant starvation. Africa faces other problems such as illiteracy, high unemployment rates and healthcare challenges, such as HIV/AIDS. The number of Internet users is estimated close to 4.5 million with about 2.5 million of this found in South Africa and another 1 million taken up by Egypt (Palmgren, 2002). Additionally, Africa's telecommunication services are highly regulated in the form of state owned monopolies. Some countries such as Morocco, Algeria, Tunisia and other North African countries have Internet policies that affect online freedom of expression (Gajjar, 2002)

The digital divide is a growing concern for Africa due the disparity between access to ICTs among the potential consumers. This disparity is caused by among other factors insufficient infrastructure, inappropriate or weak policy regimes, inefficiency in the provision of telecommunication network, lack of locally created content, institutional weakness, limited economic resources, high cost of access (Acacia, 1997). Additionally, Africa suffers also from low teledensity, 1000 people; lack of content that meet users needs; limited number and low quality of technicians to build infrastructure; lack of positive attitude towards limited computer literacy; lack of availability of e-government infrastructure (Nelson, 2002). Africa is a leader in Africa in Internet access and has 33.7 percent telephony access and 51.2 percent telephone access and 51.2 percent telephony access (ITU, 2002). Additionally, although its telephony access is a huge waste of resources as network infrastructure unnecessarily (Gordon, 2002).

There is increasing amount of data on the Internet, posing growing managements constraints. Data on the Internet is now measured in petabytes, exabytes and zettabytes rather than gigabytes. Petabyte equals 4 million typed pages and exabyte is around 400 million typed pages (ITU, 2002).

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There is need in introducing technology to pay attention to a country's organisation needs, the potential social implications of technology and th

distances. Ghana has instituted use of wireless payphone kiosks as a cost-effective application measure to broaden access to rural areas. Additionally, broad reliable and efficient supply of telecommunication services at an affordable cost need to be implemented. Policies that balance national telecommunication infrastructure development and, universal access for all citizens to basic telephone services at affordable prices are important. Governments need to consider computer training through school curricular and establish telecentres for community use.

Policy would help address the emerging issues such as intellectual property, freedom of press, freedom of expression, and privacy rights. The policy would provide guidelines on development of common standards and harmonisation of ICT in the country. Additionally, ICT policy would ensure some access equity by waiving certain tariffs associated with the import of electronic equipment meant for education, research and development purposes. It would ensure that there is coordination and coherence in the development of ICT infrastructure and the use of ICT resource. Other expectations from ICT policy are improvement in the delivery, quality and efficiency of services and products. The policy would help people and organisations to better understand and cope with changes in technology. The policy would provide guidelines for infrastructure development, training, benchmarking, creating competitive environment, ensuring coordinated development of ICT industry and bridging the digital divide. A good ICT policy would reduce wastage of resources and improvement of return to investments, accountability, and enhancement of information sharing

With progress towards convergence of various ICTs, it is important for relevant legal frameworks such as Multimedia Act to be put in place in order to encourage players in the telecommunication sector to adopt convergent technologies that would enhance affordability of access to services. Such legal framework would ensure access by all to information in appropriate formats and would provide a strong basis for deployment of multipurpose/multimedia community centres, community broadcasting, and telecentres. Additionally, cost reduction through adopting suitable pricing models would help adoption of the Internet by the majority of people including those who live in the rural areas. The service providers especially ISPs and telecoms providers could come together and transparently determine how to price the bandwidth in order to spur Internet uptake, deploy infrastructure cost effectively and adopt suitable technologies for network expansion. Governments could explore ways of providing telecommunication services in the rural areas and under-serviced areas through issuing small medium and micro-enterprises licenses. It is also vital to consider the enactment of an e-learning legislation that would help develop national e-learning strategy for respective countries to promote learning over the Internet.

The policy would also address liberalisation of the telecommunication sector, research and development funding, incentives for content development, and human resource development. Similarly, national skills development and transfer policy is needed to ensure that organisations, which have largely, expatriate staff, pass skills onto the local staff. Similarly, training of teachers

on ICT and the digital literacy of pupils is critical as is support of school based laboratories and university centres of excellence to help in the ICT diffusion.

Regulatory and policy frameworks are important to guide harmonious implementation of e-learning and address issues relating to intellectual property, copyright, data protection, content development, and accreditation of e-learning programmes. The role of private sector and partnership with e-learning providers would be defined through policy framework. The policy would address infrastructure development, developments of common standards, coordination and harmonization of ICTs in the country.

The policy would spell out government role and that of the private sector in ICT infrastructure development. It would address resource and manpower development, encourage growth of technological innovation. The policy would address the issue of digital illiteracy and access equity to telecommunication resources by waiving some tariffs. The policy would address bandwidth apportionment, communication of voice over data networks, and integration of various technologies. The policy would highlight technological developments that would need to be made in order to meet e-learning objectives. The policy would address financing of research, scientific and technological development. Universal access would be addressed by policy so that ICT development is not skewed towards certain sections of society (BOTEC, 2002).

Conclusion

For Africa to make effective use of ICTs to enhance its tertiary education environment, the various challenges that have been discussed in this paper have to be addressed. An effective legal, regulatory and policy framework is vital to enable implementation of viable e-learning strategies. Such framework should address among other things: the readiness of data systems infrastructure to support the move to e-learning. The framework should also address the readiness of legal infrastructure especially in relation to laws and regulations needed to facilitate the move towards e-learning. Such infrastructure would address issues like intellectual property, security and data protection. It is also important that the framework addresses the readiness of the institutional infrastructure to implement e-learning and also act as a focal point for creating awareness. The framework would in addition address issues of coordination of e-learning initiatives

The importance of human resource infrastructure can not be over emphasised for the successful implementation of e-learning strategies. In this regard, the framework would address how to deal and influence users' attitudes towards the adoption of e-learning strategies. It is vital to ensure that users' readiness and acceptance to adopt e-learning systems is guaranteed. The relationship between institutions who own the e-learning strategy and other stakeholders such as vendors of systems, government and private sector has to be addressed to delineate clearly the role that each one of them would play. The readiness of telecommunication infrastructure to handle the e-learning systems should be assessed in the context of bandwidth, efficiency, accessibility, etc and appropriate decision taken whether to implement e-

learning or not. Finally the commitment both for government and the e-institutions implementing e-learning programs need to be assured. Such commitment would be reflected in vision, funding strategy and integration of e-learning in the overall operations of the institutions, while the institutionalisation of e-learning would be reflected in national educational policies.

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