



KENYATTA UNIVERSITY

**UNIVERSITY ROLES IN MEETING ASPIRATIONS
FOR ICT AND ECONOMIC DEVELOPMENT**

By

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The Unique Characteristics of ICT

ICT can be a powerful enabler of development goals because its unique characteristics dramatically improve communication and the exchange of information to strengthen and create new economic and social networks:

- ICT is *pervasive and cross-cutting*. ICT can be applied to the full range of human activity from personal use to business and government. It is multifunctional and flexible, allowing for tailored solutions—based on personalization and localization—to meet diverse needs.
- ICT is a key enabler in the *creation of networks* and thus allows those with access to benefit from exponentially increasing returns as usage increases (i.e. network externalities).
- ICT fosters the *dissemination of information and knowledge* by separating content from its physical location. This flow of information is largely impervious to geographic boundaries—allowing remote communities to become integrated into global networks and making information, knowledge and culture accessible, in theory, to anyone.
- The "digital" and "virtual" nature of many ICT products and services allows for *zero or declining marginal costs*. Replication of content is virtually free regardless of its volume, and marginal costs for distribution and communication are near zero. As a result, ICT can radically reduce *transaction costs*.

- ICT's power to store, retrieve, sort, filter, distribute and share information seamlessly can lead to substantial *efficiency gains* in production, distribution and markets. ICT streamlines supply and production chains and makes many business processes and transactions leaner and more effective.
- ICT facilitates *disintermediation*, as it makes it possible for users to acquire products and services directly from the original provider, reducing the need for intermediaries. This cannot only be a considerable source of efficiency, but has in fact been one of the factors leading to the creation of so-called "markets of one," leveraging ICT's potential to cater to the needs or preferences of users and consumers on an individual basis.
- ICT is *global*. Through the creation and expansion of networks, ICT can transcend cultural and linguistic barriers by providing individuals and groups the ability to live and work anywhere, allowing local communities to become part of the global network economy without regard to nationality, and challenging current policy, legal and regulatory structures within and between nations.

These characteristics suggest that ICT has the potential, if conceived as a means and not an end in itself, to be a powerful enabler of development. However, the fact that ICT can, in theory, assist development efforts does not mean that it will necessarily do so. In order for ICT to positively foster development goals, it must be employed effectively.

ICT for Education

Across a range of educational applications, ICT is being harnessed to improve the efficiency, accessibility and quality of the learning process in developing countries.

One of the most clearly demonstrated applications is *distance education*. Distance education has been a particularly successful model in developing countries where affordability and geography have been real barriers to access. The six largest distance-learning universities in the world are located in developing countries: Turkey, Indonesia, China, India, Thailand and Korea—all of which offer expanding virtual campuses. To date, distance learning has mainly been applied to tertiary education where the motivation and commitment of students is high. In the case of primary and secondary education, ICT has been found to significantly enhance the learning process by enabling increased access to knowledge and more collaborative and interactive learning techniques, but is not an effective substitute for close personal supervision from teachers or parents.

The development of *scientific research* networks on a worldwide basis, usually over the Internet, is also helping to empower indigenous research and development programs in developing countries. Virtual research groups—composed of interconnected specialists in different parts of the world—allow databases to be shared, conferences to be organized, papers to be circulated and discussed, and collaborative research and reporting to be undertaken. A proliferation of such collaboration is occurring on both a North-South and South-South basis.

Another rapidly growing area of ICT-mediated learning is in the delivery of *technical and vocational training*. Because ICT can facilitate sophisticated and customized performance simulation at low marginal cost, many organizations and vocational training facilities are employing ICT to train workers in an array of functional areas—from healthcare to IT services—even to train teachers themselves. For example, Cisco's Networking Academy Program provides a 280-hour technical training course over the Internet. This course trains workers in

developing countries in designing, building, and maintaining computer networks, enabling students to obtain jobs in the local IT industry.

ICT-enabled solutions also present significant opportunities for enhancing the efficiency and effectiveness of *education administration*. Through the use of ICT data repositories and networks, curricula can be developed collaboratively, educational materials can be procured more cost effectively, staff and student time can be scheduled more efficiently, and individual student performance can be monitored more closely. In Southern Africa, Educor, a private conglomerate of education institutions, uses ICT networks to facilitate collaborative curriculum development among educators across its schools—improving the quality of the curriculum and avoiding duplication of effort.

ICT INITIATIVES IN KENYATTA UNIVERSITY

The ICT initiatives going on in Africa today have opened a new understanding of technology that is applicable in our educational institutions and at all levels. The Universities in particular consider themselves the main beneficiaries of these technological innovations. Kenyatta University in Kenya is one such university that has risen above other universities in the region to become a show case with its fast growing e-Learning/ICT initiatives.

1. Open Learning.

Perhaps, one of the shortcomings of residential, face-to-face programmes is that it limits access because of the need to provide halls of residence, lecture halls, laboratories, etc. Whereas demand for higher education has continued to increase, the supply of university places has not moved at the same pace.

Before 2003, Kenyatta University offered residential programmes only to its full-time and part-time students. In 2003, an open learning mode of teaching and learning was launched. This has had the double effect of increasing access/enrolment and limiting capital expenditure. Student enrolment into degree programmes has more than doubled from 10,000 students in 2000/2001 to 21,000 in 2005/2006.

With over 4000 students enrolled in the open learning programme, the University established Regional Centres and located them strategically

in the eight (8) provincial headquarters namely: Nairobi, Nyeri, Nakuru, Mombasa, Garissa, Kisumu, Kakamega and Embu. Each Centre has a Regional Coordinator.

The University, conscious of the need to provide quality education to its open learning students similar to that full-time students get, introduced e-Learning as a mode of teaching and learning in 2005. It subscribed to the e-Learning Management System, the Blackboard software which is used by over 2000 institutions worldwide with over 20 million subscribers. This Learning Management System (LMS) has proved to be extremely useful in teaching and learning; lecturers upload their course materials on the LMS and communicate with students through the discussion forum on regular basis.

From then, the University has speedily moved to fully embrace technology and embarked on a journey to institutionalize Information and Communication Technologies (ICTs) within its teaching/learning system. A noticeable outcome of this is that whereas ICTs were originally intended for the open learning programme, they have now permeated all programmes.

2. Virtual Learning

Kenya University is an important member institution of the African Virtual University, a project initiated by the World Bank in 1997. Programmes offered collaboratively between Kenya University and other universities are delivered to students through online communication tools such as chat rooms, email, bulletin boards, tele & video conferencing. The African Virtual University in Kenya University is well equipped with modern ICT related paraphernalia, e.g internet connected computer rooms, video and tele- conferencing halls, VSAT, etc.

3. Management

University-wide consultations which took place prior to the preparation and launching of the 10-year Strategic and Vision Plan recognized that there are key administrative and management activities that are so wasteful of the institution's financial and human resources that plugging the loopholes in their management would save substantial

financial resources. With some financial support from The Rockefeller Foundation, the University has now embarked on improving administrative and management efficiency by computerizing key areas of operation, namely:

- Student admissions and tracking
- Financial management
- Medical Services
- Procurement and Store Management
- Data Management at the Central Registry
- Networking

It should be emphasized that networking is an important undertaking intended to make the transmission of information across key academic, management and administrative offices of the university possible so as to improve communication and cut down on the time needed to traverse large distances across campus delivering basic information. Networking also enables staff and students to access internet and email facilities at key sites on campus, at departmental offices and student hostels. In addition, ability by students and staff to access the internet will begin to influence their research and acceptability of teaching and learning approaches supported by computer based resources.

4. Other Initiatives

- University Strategic & Vision Plan

Kenyatta University has a 10-year Strategic and Vision Plan and a 5-year Medium term Plan. The plans target a computerization programme that will support all the activities of the University. The time-lines stipulated in the Strategic Plan has set the pace for the University.

- University ICT Policy
The University has an ICT policy, which acts as the foundation for ICT initiative within the University. This policy operates under the umbrella of the National ICT Policy developed by the Ministry of Information and Communication.
- Increased Bandwidth
For the university to implement e-learning effectively and efficiently, there was a need to increase the bandwidth of internet access. Thus the University has increased its bandwidth

from 1 mbps up to 2mbps this year. This has enabled our students and staff to have faster internet access, access to digital libraries worldwide and participation in e-conferences and discussion forums. It has also enhanced uploading of e-learning course materials and faster downloading.

- **Increased Number of Computers**
The University has in the past six months purchased 662 computers to add on to the existing 1,125 computers. The projection is to have over 2,772 by the year 2008. It is envisaged that in the next few months, laptops will be provided to all members of Senate to facilitate e-Senate meetings.
- **ICT Training Strategy for Staff & Students**
Kenyatta University intends to undertake a project on ICT literacy to target all the 747 teaching staff and 410 non-teaching staff working in various sections of the university whose nature of work require the use of computers. The University has developed the ICT literacy content that is to be taught within 140 hours.
- **Building a University Internetwork**
The University has developed a project for networking all the campuses. It is hoped that such an internetwork will create an intranet that will enhance information sharing within and outside the university. The proposed network will use a combination of communication media namely: fiber optic (multimode fiber optic cabling), wireless (microwave and infrared) and twisted pair (Unshielded Twisted Pair, UTP). It is also hoped that this project will reduce paperwork in offices and transform staff and students into a community of practice that is IT compliant and self-motivated.
- **Maintaining Security of ICTs**
Plans are underway for the University to create a Unit within the institution that will deal with ICT matters such data security, data network security, software development and systems administration on a daily basis.

CHALLENGES

- There are a number of technological constraints that hinder the use of ICT in education. Telephone and other communication infrastructures outside of major cities remain inadequate. Connectivity beyond major capital cities poses a potential problem in creating a national distance education strategy. Even though Africa has about 12% of the world's population, it includes only 2% of the global telephone network with over half of the lines in cities (Marcelle, 1998). Telephone density is less than two lines per 1,000 inhabitants, compared with 48 per 1,000 in Asia, 280 per 1,000 in America, 314 per 1,000 in Europe, and 520 per 1,000 in high-income countries.
- Even most of the institutions whose campuses are connected to the internet suffer from low speed and frequent breakdowns of servers. Some of the connections are so painfully slow that ICT is considered a bother. There have been cases where it takes several attempts over a number of days to download a single big document.
- Another challenge is the lack of a trained cadre of professionals to support the integration and use of ICT in education. The effective use of information and communication technologies demands that faculty be familiar with teaching in an online environment. While there are a number of academic staff, arguably the younger ones, who willing to be trained, there exist a group of staff who are unwilling to try out the technology. This situation poses a major challenge in the widespread use of ICT for teaching. Research on the use of ICTs in different educational settings over the years invariably identify as a barrier to success the inability of teachers to understand why they should use ICTs and how exactly they can use ICTs to help them teach better. Unfortunately, most teacher

professional development in ICTs are heavy on “teaching the tools” and light on “using the tools to teach.”

- Another challenge relates to the technical support that is required for ICT in education to be effective. The general competencies that are required would be in the installation, operation, and maintenance of technical equipment (including software), network administration, and network security. Without on-site technical support, much time and money may be lost due to technical breakdowns.
- One of the greatest challenges in ICT use in education is balancing educational goals with economic realities. ICTs in education programs require large capital investments and developing countries need to be prudent in making decisions about what models of ICT use will be introduced and to be conscious of maintaining economies of scale. Ultimately it is an issue of whether the value added of ICT use offsets the cost, relative to the cost of alternatives. Universities in Africa generally have limited budgets; they simply do not have the funds for the huge investments required in ICT infrastructure development. Even where basic infrastructure has been provided by development partners, the financial litmus test of ICT-based programs is survival after donor money has run out.

Conclusion

Unprecedented global flows in information, products, people, capital and ideas facilitated by ICT offer great potential for radical improvements in human development. The high-income countries of the North are benefiting immensely from this. In Africa, universities should be in the forefront in promoting the use of ICT for development. Firstly, universities should train highly skilled manpower capable of moving the economies of African countries towards

becoming ICT sensitive and compliant. Secondly, universities themselves should exploit to the fullest the advantages of ICT in increasing their capacities to enrol more students than they traditionally do. Thirdly, the efficiency of universities will be greatly enhanced if all administrative and management functions are computerized. Although the capital outlay required to provide ICT infrastructure is beyond the means of most African universities, private sector-public sector partnerships is a possible strategy that can be used to surmount this challenge.

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