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The Southern African

ICT for Education Summit 2012

26-27 January, Victoria Falls

ICT FOR EDUCATION – SOUTH AFRICA, SWAZILAND

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higher education
& training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

Investment in ICT for Higher Education

By

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“I am fundamentally an optimist. Whether that comes from nature or nurture, I cannot say. Part of being optimistic is keeping one’s head pointed towards the sun, one’s feet moving forward. There were many dark moments when my faith in humanity was sorely tested, but I would not and cannot give up to despair. That way lays defeat and death.”

Nelson Mandela



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Introduction

Socio-Political Context of South African Higher Education

- History of Apartheid discriminatory budgeting
- Apartheid-State manufactured inequalities and deficits
- South Africa remains the **most** unequal society in the world: the majority of citizens still live in abject poverty.
- Planning for: Inclusivity, equity and transformation
- National resolve: to invest in education and to ensure that the system is throughput driven.
- Impact: knowledgeable, competent, self-driven citizens



Key ICT Challenges in Higher Education

➤ Skills Challenge

Education policy aims to promote **access**, improve **quality**, **develop research capabilities** and **skilling young people** ;

- Plus minus 3 million young people with no schooling and minimal employment prospects
- Access barriers: poverty, poor infrastructure in rural areas, patriarchy and uneven availability of enabling gadgets for the disabled.

➤ Network Readiness Challenge

- South Africa is ranked 61 out of 138 countries on the networked readiness index

Response to the Challenges

ICT Infrastructure Investment by Government

- SA government has responded to the network readiness challenges by investing in infrastructure through
 - Sentech
 - Broadband Infracore
 - WACS and EASSy
 - SANREN-The South African Research and Education Network
 - CHPC-Centre for High Performance Computing
 - The Square Kilometre Array



Sentech

- Sentech will be building a National Wireless Broadband Network, focused on rural access.
- The network will:
 - connect learning institutions located in the rural areas to each other and other institutions in the country
 - foster collaboration and exchange of information
- Sentech has been allocated a budget of R 500 million for the rollout of this network.

Broadband Infraco

- Broadband Infraco (BBI) will invest to upgrade its existing network, increasing the network's capacity and reach.
- The upgraded network will provide a backbone for the Sentech broadband network.
- BBI has been allocated over R 300 m for the upgrade of its network.



EASSy and WACS Submarine Cables

- The government has invested in the submarine cable projects coming down the east and the west coasts of Africa.
- These projects will create an additional eight (8) terabits of capacity for Southern Africa, over sixty times (60) the capacity available from the SAFE cable project, that preceded these two projects.
- This increased capacity will result in a reduction in the prices of broadband connectivity.



SANREN – South African Research & Education Network

- SANREN is the national broadband connectivity network for public research institutions and universities and it is linked to international networks, such as GeANT.
- The SANREN backbone will connect universities and public research organizations at a minimum speed of 10 Gigabits per second (Gbps) over the next few years.
- Since 2007, the South African Government has invested R886 million in the SANREN project.
- The priority is to connect all rural based institutions

CHPC – Centre for high performance computing

- The CHPC, ranked as number one in Africa, was launched in 2007 with the objective to build a world-class supercomputing facility for research, development and innovation. The centre hosts a core set of supercomputers with overall computing power of 50 Teraflops (TFlops) and a data centre with capacity of 0.5 Petabytes (PB) .
- The commissioning of a Sun Microsystems hybrid supercomputer (29 TFlops) took South African high performance capabilities into the top 500 in the world.
- Flagship projects of the CHPC are: how best to address challenges in diverse areas such as 3D visualisation, finance, epidemiology and computational biology.
- The CHPC has also established an Advanced Computer Engineering (ACE) laboratory to develop skills for local supercomputer architecture development. The ACE lab works very closely with the design team of KAT7/MeerKAT project being the demonstrator for South Africa's bid to host the Square Kilometre Array Telescope.



Square Kilometre Array

- The project will investigate key questions in astronomy and physics, leading to breakthroughs in our understanding of cosmos and its evolution.
- The SKA will generate massive volumes of data per day which will need to be communicated globally. The infrastructure investment already made by the Government will make it feasible for knowledge generated from the SKA to be shared globally. Students in the sciences at South African institutions will have access to world class and leading edge thinking as a result of the location of the SKA in Southern Africa.
- The net outcome of this investment is that institutions of higher learning in South Africa have a network that allows for broadband connection from anywhere, no matter how remote, accessing vast volumes of information, on virtually any device.



“Infrastructure in the Cloud”

Institutions would depend more on an infrastructure ‘in the cloud’ than an infrastructure ‘on the ground’

➤ The new institution

- smaller head-office.
- Virtual classroom
- contracts its educators from any location, using broadband connectivity.
- KidSmart Early Learning Programme for ages 3 to 7
- managed on the basis of quality and performance and much less on physical space and facilities.
- uses Open Educational Resources
- uses peer reviews and social media
- All 23 South African Universities connected
- All 50 FET Colleges connected

Intra-national digital divide and the potential of mobile phones

- Investing in pressures on government and educational institutions
- Intra-national digital divide
 - Digital natives and digital strangers
- Mobile phone a catalyst for students
 - move from digital strangers to digital natives
 - 93 subscriptions per 100 inhabitants in South Africa.
 - 90 percent of youth generation users are in Nigeria, South Africa, and Indonesia: they use mobile phones more often than desktop or laptop computers to access the Internet.

Career Guidance

- Committed to making use of ICT to reach out to the most vulnerable learners country-wide
- Provide information on career options, post-school by mid-year annually: by using multi-channel career advice services project providing career advice using, social media such as Twitter, Mixit and Facebook and a web site.
- SAQA, the Department of Higher Education and Training building a fully-fledged web based career portal system

Career Guidance

- Women development in and through ICT
- The National Electronic Media Institute of SA and Satellite Applications female graduates
- ICT sector charter used to fast track inclusivity and transformation

Interface between Learning and Work

- Combination of course work at universities, universities of technology and Further Education and Training: offering Vocational and Adult Education around structured learning at work.
- Achieved through professional placements, work-integrated learning, apprenticeships, learnerships, internships, skills programmes, and work experience placements.
- Professional, vocational, technical and academic (PIVOTAL) programmes
- Courses from programmes culminating in an occupational qualification.
- Opportunities for innovative ICT applications could be an enabler.

Conclusion

- Smart partnerships between Governments crucial: affordability key and transfer of technology to developing countries.
- Effective utilization of ICT tools in education can enable centres of higher education to play a crucial role in:
 - developing citizens,
 - strengthening and deepening our democracy,
 - inculcate the culture of human rights and respect for the rule of law
- ICT solutions offer unprecedented opportunities for the region and the continent to be connected through the cloud.
- ICT offers opportunities for development of African scholars with a critical consciousness and competencies urgently needed for the realization of Nepad and an African Renaissance dream.

Questions for Dialogue

Key questions that will require dialogue are around:

- Delivery of last mile connectivity to our existing traditional brick education institutions, especially our FET colleges and rural based adult training centres;
- Provision of digital open content for our youth for varied learning programmes and learning abilities;
- Linking learners opportunities and improving the employment rate of learners who complete their studies, through the use of ICT applications;
- How do we contribute to the improvement of the quality of education by bridging the digital divide;
- Leveraging mobile technology for demonstrable education outcomes and inclusivity;
- Consolidating our efforts toward a Pan-African virtual university;
- Investments in Technology transfer?



“I have walked that long road to freedom. I have tried not to falter; I have made missteps along the way. But I have discovered the secret that after climbing a great hill, one only finds that there are many more hills to climb. I have taken a moment to rest, to steal a view of the glorious vista that surrounds me, to look back on the distance I have come. But I can only rest for a moment, for with freedom come responsibilities, and I dare not linger, for my long walk is not ended”.

Nelson Mandela



THANK YOU

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