Bridging the Digital Divide and the Use of Information and

Communications Technology (ICT) in South African Universities:

a Comparison Study among Selected Historically Black Universities (HBUs)

and Historically White Universities (HWUs)

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Abstract: It has become common place for students in historically white universities (HWUs) in South Africa to have 24 hour access to computers, the Internet, e-learning facilities, check results online and even register online. However, historically black universities (HBUs) are still battling to have access to these facilities. On a macro level, the issue of lack of access to basic ICT facilities or digital divide exists. This is evident in the fact that developed nations like U.S.A and Switzerland have significant access to ICT, while under-developed nations in Africa like Ethiopia and Congo do not enjoy considerable access. On a micro level in South Africa, digital divide still exists. Even the divide exists among South African Universities as students in historically white institutions like Pretoria, Rhodes and Stellenbosch Universities enjoy unlimited access to ICT facilities like computers and the Internet. However, the reverse is the case in HBUs where access rate is very limited and personal observation bears this out as most historically black institutions like the University of Fort Hare, University of Limpopo, and University of Zululand, just to mention a few are still battling with the issue of access to ICT facilities.

This paper presents the findings of a survey conducted to examine the present ICT status / capacity of HBUs compared to what exists in HWUs in South Africa. It will attempt to identify the reasons for the continued disparity in ICT access between HWUs and HBUs and also to identify how HBUs can address the divide and leapfrog to an era of full ICT access.

1. Introduction

1.1 Overview of the Digital Divide

Media scholars like Beebe, Kouakou, Oyeyinka & Rao (2003) states that the term, "digital divide" refers to the gap that exists between those who have access to and can also effectively use new information and communication tools, such as the internet, and those who cannot and do not have access. The digital divide that exists today in South Africa has its root in the legacies of the apartheid era. Globally, digital divide exists and this is evident in the fact that developed nations like U.S.A and Switzerland have significant access to ICT while

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under-developed nations in Africa like Mali, Ethiopia and Congo do not enjoy considerable access. For example in the U.S.A, 66 out of every 100 people have access to personal computers (PCs) while 71 out of every 100 people have access to PCs in Switzerland. On the contrary, the rate of access to PCs in some African countries like Nigeria, Ethiopia, Congo is less than 1 out of every 100 people (Bridging the Digital Divide in Africa, 2003; World Telecommunications ICT Indicators, 2004).

On a micro level in South Africa, digital divide still exists with only 73 out of every 1000 or 7.3 out of every 100 people having access to personal computers and 3.1 million people having access to the internet out of 45.3 million people (Profile: South Africa; World Bank Development Indicator Database, 2004).

Even the divide exists among South African Universities as students in historically white universities like Wits, Rhodes and Stellenbosch Universities enjoy unlimited access to ICT facilities like computers and the Internet. In addition, most students in these HWUs have PCs in their residences and some are even connected to the internet (Jacot, 2004; Chambers 2005 and Kassa, 2004; Dreijer, 2005: Email from Rhodes & Stellenbosch). However, the reverse is the case in HBUs where access rate is very limited and personal observation bears this out. This is evident in the sound policies and breakthroughs that have been achieved in the various areas of ICT by the HWUs like University of Pretoria, Stellenbosch University and Rhodes University compared to their HBU counterparts like the University of Fort Hare (UFH), the University of Limpopo (UNIL), Turfloop Campus, and University of Zululand (UZULU), just to mention a few. For example, Rhodes University, Wits University and Stellenbosch University have fully embraced e-learning, which is higher institution learning through the use of the internet and other computer facilities and soft wares (Acceptable ICT Policy for Rhodes University, 2001; University of Pretoria's IT Policy, 2001; Developing Digital Libraries in South Africa, 2000; UCT's Information & Technical Services Policy, 2004; Stellenbosch University IT Strategy, 2004; General Trends in the use of ICT in Education).

Looking at the University of Fort Hare (UFH), University of Limpopo and University of Zululand as a typical example of HBUs, much is still to be done for these Universities to attain a high ICT capacity. There is need for these Universities to leapfrog towards bridging the digital divide. It must be noted that the problem of access in HBUs is partly due to the past legacies of apartheid, which strategically favoured the HWUs while the HBIs suffered gross neglect and lack of essential learning facilities. However, with the advent of democracy, the South African government through the Ministry of Education issued the Education White Paper 3 (Notice 1196 of 1997) with the aim of correcting inequalities of the past. The focus was on the transformation of South African Higher Education and emphasis on the effective use of information, communications and technology (ICT). This is inspired by the fact that ICT is playing a very significant role in every facet of human endeavour like e-government, e-learning, ICT-improved healthcare (e-health), e-commerce and other areas (Technology-Enhanced Learning in South Africa: A Strategic Plan, 2000).

The government was concerned about laying solid foundations for the development of a learning society, which can stimulate, direct, and mobilize the creative and intellectual energies of all people especially students towards meeting the challenge of reconstruction and development (Government White Paper 3: Notice 1196 of 1997; Technology-Enhanced Learning In South Africa: A Strategic Plan, 2000). It is worth mentioning that HWI have strong ICT strategies / policy and access to the new technologies.

1.2 ICT's Role in Education

There is general agreement from media analysts on the crucial developmental role of ICT. Nulens (2003) & Jensen (2003) state that in education, information and communication technology (ICT) holds the promise of

transforming learning in new and powerful ways with the internet playing a very prominent role. Also, Stevenson (1988), Braman (1993) and Tettey (2001) noted that ICT is the infrastructure that brings people together in different places and time zones, with multimedia tools for data, information, communication and knowledge management in order to expand the range of human capabilities.

There is therefore a growing awareness of the potential power of information technology for improving access to higher education and enhancing teaching and learning. Gurstein (2000) and Ioannide & Vosniadou (2003) assert that the link between education and economic growth therefore places greater focus on national governments to increase the levels and quality of education. There is a global trend towards quality education for all. The growth of ICTs in education is a global phenomenon. Countries in both the developed and developing worlds have expressed visions of participating in and shaping the global information society. These visions regard education as the primary way for ICTs to produce competent learners, suitably qualified and skilled to contribute to economic growth. Bonfadelli (2002) & Gordon (2003) also note that the general notion worldwide now is that ICTs are a fact, a way of life and societies; countries and individuals need to be familiar with and work with ICTs in order to avoid being left out. In education, this translates into a call for all learners to be familiar with ICTs. Failure to achieve this is understood as leaving learners ill-equipped in a modern world of technological advancement.

1.3 Meaning of ICT

Kouakou (2003) and Nwuke (2003) assert that ICTs refer to various technologies that enhance the creation, storage, processing, communication and dissemination of information. ICTs also refer to the different infrastructures used in these processes, their applications and the numerous services these infrastructures render. The following technologies are identified as the elements of ICTs:

(1) Media of communication (e.g. Radio and Television)

(2) Information machine (e.g. Computers)

(3) Telecommunications technologies and equipments (Satellites, fibre optic cables, phones, facsimile machines). Telecommunications infrastructures in particular have become the driving forces of ICTs; they have the capability to link all various ICT elements together (Macro Environment & Telecommunications, 2003).

1.4 Bridging the Divide on a Micro Level in South Africa

The South African government through the 1996 Telecommunication Act stressed the need to promote the universal and affordable provision of telecommunication services. This act set up the Universal Service Agency (USA) to promote access to telephony and other information and communication technologies (ICTs) throughout the country, particularly in the townships and rural areas (Literature Review for the Telecentres Study, 2000). The Department of Communication gave the Universal Service Agency the mandate to set up Telecentres that are to provide access to these information facilities. The telecentres are to provide telephone services to users, and also be equipped with computers, access to the internet, printers, copier, fax, scanner, television and video recorders. The aim is to expose people to exciting potential use of technology (The Universal Service Agency's Telecentre Programme, 2003; Current Research on Bridging the digital divide, 1999; Bussing past the digital divide, 2003).

Bianca Wright (2003) states that the telecentres are not the only innovative project aimed at addressing the very real issue of the digital divide in South Africa. For example, Professor Peer Wentworth of Rhodes University worked on a project similar to India's "Hole in the wall project" in which a computer is installed, literally, into a hole in a wall near a derelict playground where street kids play. The idea is to install computers in secure locations in townships, such as shops, post offices, and community centers, to allow passers-by to access them through

buildings' windows. Such access will be available for 24 hours a day since there is no direct access to the computer itself. In essence, the aim of the project is to provide simple, cheap, secure access to computing facilities in underprivileged areas, thereby bridging the digital divide. Martindale (2002) also noted that organisations and IT industry players are also involved in the drive to bridge the gap. Microsoft South Africa, for example, has a number of projects aimed at providing real access and training to previously disadvantaged and rural communities (Bridging the digital divide in South Africa, 2002).

1.5 Bridging the Digital Divide in South Africa Universities

It must be noted that a lot of studies have been carried out in the area of digital divide to establish the great disparity that exists between the haves and have-nots. Wright (2003) established that there is a huge disparity in the technical levels of the students who flock to the Universities and Technikons in South Africa. She states that many of these students have never seen a computer, let alone use it or connected to the internet (South Africa & the Digital Divide, 2002; Bridging the Digital Divide in Africa, 2002). Considering the legacies of apartheid regime where HWUs were favoured financially to ensure their upkeep and development, the HBUs suffered tremendous neglect. Looking at the issue of digital divide that exists among South African Universities, it is evident that most HWUs have taken initiatives and put policies in place to ensure the effective use of ICTs (UCT's Information and Technical Services Policy, 2004). However, many HBUs are still struggling to leapfrog into the era of effective ICT use. Using University of Fort Hare (UFH) as a case study and being the foremost HBU in South Africa, UFH has also suffered from the legacies of apartheid. This is evident in the fact that the University is under developed like other HBUs and most especially in the areas of ICT usage. UFH is however focused towards taking some steps to leapfrog into a new knowledge society as highlighted in the University's Strategic Plan 2000 (UFH's SP 2000 Document).

According to the UFH's IT Director, Mr Mickey Moodley, the University has enjoyed partnership and sponsorships from the Department of Education (DoE), Development Bank of South Africa (DBSA) and Thintana Group towards beefing up its ICT capacity. For example, from year 2001 to date, a total of 797 new computers have been acquired by the University through various fundings received. From these, 527 computers in 8 computer laboratories have been set up for student use on campus and 270 computers have been set up for staff members use --- all having internet access. Other HBUs have taken similar steps towards improving their ICT status (Maphangu, 2005; Rahimi, 2005) but much is still left to be done.

1.6 Theoretical Underpinning

The theoretical underpinning that best explains this research study is the Knowledge Gap Hypothesis as postulated by Tichenor, Donohue and Olien in 1970. This theory emphasises the importance of bridging the information gap that exists between the haves and have nots. It states that:

"as the infusion of mass media information into social system increases, segments of the population with higher socio-economic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than increase" (Severin and Tankard, 1988: 287).

De Fleur & Ball-Rokeach (1996) argued that communication technology is changing so rapidly that many people speak of a "communication revolution" or an "information explosion". Some of the new technologies are videotape recorders, video cassettes, cable television, home delivery of newspapers printed via satellite, access to computer information services from home computers and communication between home computers via modems. Tettey (2001) concurs that many of these technologies have the dramatic effect of giving the user much control

over the communication process and the information received. Severin & Tankard (1988) further argued that theoretically, these new technologies can be used to the benefit of people throughout the society. However, many of these technologies are expensive and because of the cost, these technologies may be available to those who can afford them than to those who cannot. For this reason and others, an unfortunate effect of the technological revolution in communication could be a further widening of the knowledge gap and the digital divide. For example, whether ownership of computers provides evidence to who will have access to new technologies and information and who will not?

Severin & Tankard (1988), believed that the tendency is for the well placed, the rich and for example, the financially viable individuals and higher institutions as in the case of South African HWUs and HBUs, to continue to have greater access to the new technologies. On the other hand, the poor and financially handicapped higher institutions will continue to lack behind in terms of access to the new technologies.

2. Results of Findings: HBUs ICT Capacity VS HWUs ICT Capacity

(Students: Pc Ratio)

For the purpose of this paper, three historically black universities namely the University of Fort Hare in the Eastern Cape Province, University of Zululand in the KwaZulu Natal Province and University of Limpopo (formerly University of the North) in the Limpopo (Northern) Province were picked for investigation and comparison. Also, three historically white universities namely Rhodes University in the Eastern Cape Province, Stellenbosch University in the Western Cape Province and Wits (Witwatersrand) University in the Gauteng Province were picked for investigation and comparison. The student: Pc ratio of students in these Universities over a period of two years, are compared below:

HBU's	2004	2005
University of Fort Hare	21 : 1	10 : 1
University of Zululand	18 : 1	23 : 1
University of Limpopo	15 : 1	17 : 1

HWU's	2004	2005
Rhodes University	2 : 1	5 : 1
Stellenbosch University	1 : 1	3 : 1
Wits University	No Available Statistics (All Students have full ICT Access)	No Available Statistics (All Students have full ICT Access)

The findings above showed the situational analysis that exists in these selected South African historically black universities (HBUs) and historically white universities (HWUs). The findings have been analysed using both the quantitative and the qualitative methods with findings presented numerically and in words as further discussed below (Dooley, 1990; Du Plooy, 2002; Wimmer & Dominick, 2003).

2.1 Historically Black Universities (HBU's)

2.1.1 University of Fort Hare

Looking at the HBUs, the University of Fort Hare (UFH) for example had 7,818 students in 2004 with just 380 computers (Pcs) for their use. This gives an approximate access ratio of 21 students to a computer (21:1). However, as at now in 2005, UFH has a reduced number of 4,777 students (compared to 7,818 in 2004) with an improved access to 527 Pcs. This gives an approximate access ratio of 10:1. This is largely due to a huge drop in number of registered students and an increase in the number of available Pcs. Only few of this computers are not connected to the internet and students have a 14 hour access (8 am - 10pm) from Monday to Friday (Moodley,

2004, 2005).

2.1.2 University of Zululand

A similar situation exists at the University of Zululand (UZULU). In 2004, UZULU had an access ratio of 18 students to a Pc (18:1) with some of the Pcs not connected to the internet and without a 24 hour access (Canhan, 2004). In 2005, the UZULU's student enrollment stands at 9,000 with 400 pcs available for their use. This gives an access ratio of approximately 23:1 with day time access to Pcs and the internet (Maphanga, 2005).

2.1.3 University of Limpopo (Turfloop Campus)

University of Limpopo (UNIL), Turfloop Campus had 11,000 students in 2004 with access to 750 Pcs, which gives an access ratio of approximately 15:1 (Rahimi, 2004). In 2005, the student population increased to 12,500 with the same 750 Pcs available for student use. This gives an access ratio of approximately 17:1 and with a 16 hour daily access to Pcs and the internet (Rahimi, 2005).

2.2 Historically White Universities (HWU's)

2.2.1 Rhodes University

According to Jacot (2004), students enjoy a 24 hour access to Pcs and the internet with a student : Pc access ratio of 2:1. However with an increased number of students in 2005, Chambers (2005) confirmed that the current access ratio is 5:1.

2.2.2 Stellenbosch University

Kassa (2004) confirmed that students at Stellenbosch University have full access to Pcs and internet with a ratio of a Pc to a student (1:1). But with an increased number of students rising to 16,000 in 2005 and with 5,319 computers available in computer laboratories and various Departments, the current access ratio is approximately 3:1 (Dreijer, 2005).

2.2.3 Wits University (University of Witwatersrand)

Wits University is the foremost historically white university in South Africa and largely funded and well developed than any other South African University. The University occupies a huge expanse of land mass with various Departments and Schools strategically placed on the campus. It was therefore very difficult to get a detailed statistics of ICT usage at Wits. However, Pillay (2005) confirmed that it will be very difficult to get an accurate statistics because there is no real central body that controls all IT facilities at Wits. He however asserts that all students have a 24 hour access to a Pc and the internet.

2.3 Governance and Management of IT Services in HBUs and HWUs: Further Implications

While most HWUs started with investments in ICT infrastructure well over 20 years ago, most HBUs started to venture into ICT investments about five years ago. All HWUs evaluated in this study (Wits, Stellenbosch and Rhodes) have computer rooms with security and environmental control; network infrastructures; central academic computing facilities; on-campus debit card and billing systems for payment of meals, printing, and copying facilities. In addition, there are network points for access from every office and residence room; internet access, and email. All students in the residences have network points in their rooms which enable them to connect their own computers to information resources on campus and the internet. For example, approximately 60% of students in residences at Stellenbosch University have their own computers in their rooms, are connected to the internet and can connect to all electronic resources and information systems from their rooms (Dreijer, 2005).

It is also important to note that all students have electronic access to their academic records, registration information, examination results and their financial status via Intranet and portal technology. All students also

have access to learning materials on intranet WebCT servers. The percentage of course modules that have class information and / or interactive learning material available on the web is increasing. All these ICT facilities are however not available in the selected HBUs (Maphanga, 2005; Moodley, 2005; Rahimi, 2005). The IT Directors of these HBUs confirmed the challenges being faced by their Universities to improve the current ICT services - with non-availability of sufficient funding as the main problem. They however believed that with government's intervention, University Management's commitment and assistance from corporate organisations within and outside South Africa, these Universities will be able to leapfrog and improve their current ICT status.

3. Conclusion

With the increasing capacity of information and communication technologies, there has been a rise in new learning opportunities beyond the traditional "Book-teacher" model. As new technology is being accepted as the catalyst for new learning environments, access to communication has been crucial and indeed a fundamental human right. However the challenges of access to information and communication technologies are tremendous. The results of this survey clearly show the wide gap that exists between HWUs and HBUs in South Africa with regards to ICT usage. The findings showed that while HWUs are fully developed and enjoying full ICT access for over 20 years, HBUs are still struggling to leapfrog into an era of full ICT usage. While the South African government has placed policies in place to address the imbalance of the past, much is still left to be done. Apart from government interventions, HBUs also to stand to benefit from donations from corporate organisations like Telkom SA in an attempt to close the ICT gaps that exists between them and the HWUs. Probably, it will still take some years before most of the HBUs can fully bridge the digital divide.

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(Edited by Qunying Zhou and Dongling Zhang)