

**ACCESS TO AND USE OF INFORMATION AND COMMUNICATION
TECHNOLOGY BY STUDENTS AT THE UNIVERSITY OF THE
WESTERN CAPE**

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A minithesis submitted in partial fulfillment of the requirements for the degree of
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ABSTRACT

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This study investigates access to and use of Information and Communication Technology (ICT) by students at the University of the Western Cape (UWC). It examines how the issues of access and use play out at the microlevel of a historically disadvantaged institution in South Africa by investigating the institutional arrangements and practices of different computer laboratories. To examine this, the study supports a thick notion of access, which involves paying attention to both technical issues and other issues having to do with the institutional “conditions of access.” In this study the institutional conditions of access will refer to the institutional arrangements and practices of computer laboratories.

The study argues that the institutional “conditions of access” will determine use of computers. The study further argues that in order for UWC to meet its vision as laid out in the Integrated Information Strategy (2003) and to meet the ‘thicker

conceptions of access’; the university has to make sure that the conditions of access are suitable and enabling for students.

In making this argument, the study explores what ICT resources are available, how the institutional arrangements and practices influence the use of the resources and to what extent students are using computers. The study further explores which students are using the resources, where and when. It also looks at the barriers that obstruct students from using these resources optimally. It examines availability of assistance, adequate spread of computers and their location around campus. The findings shows that there is still more research that should be conducted around issues of access to and use of ICT by students in South African contexts in general, and previously disadvantaged contexts in particular. These studies could cover those students who have home ownership of computers, their level of engagement, and the scale of female students’ engagement with ICTs.



DECLARATION

I declare that **Access to and Use of Information and Communication Technologies by students at the University of the Western Cape** is my own work, that it has not been submitted before for any degree or examination in any other University and that all sources I have used or quoted have been indicated and acknowledged as complete references.

Sibusiso Zolile Mkhize



May 2005

Signed.....

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ACRONYMS

CHS	Community and Health Sciences
CSHE	Centre for the Study of Higher Education
DOE	Department of Education
EMS	Economic and Management Sciences
E-mail	Electronic mail
ICS	Information and Communication Services
ICT	Information and Communication Technology
IIS	Integrated Information Strategy
Labs	Laboratories
SMS	Short Messaging System
TLTU	Teaching and Learning Technologies Unit
UWC	University of the Western Cape



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CHAPTER ONE

INTRODUCTION

Background to the study

The increasing trend by institutions of higher education to invest in Information and Communication Technology (ICT) infrastructure assumes that increasing ICT expenditure will positively influence the academic experience. Advances in ICT are seen to hold enormous potential for higher education (Taylor 2000, Dorr and Besser 2002, Wheeler 2000, Hall 2001). Consequently, Mashile and Pretorius (2003: 132) state that “higher education institutions are gearing themselves for integrating ICT in their instruction. Even institutions, which have no intention to implement online education, are increasingly integrating ICT with their organizational structures”. Many studies have explored different variables when investigating the issues of access and use around ICT. The most common have studied the effective and innovative ways through which ICT could be employed in teaching and learning (Czerniewicz and Brown 2004, Lundall and Howell 2000, Hall 2001, Wheeler 2000), barriers for women for participating in this global network (Burkle 2001, Atan et al 2002) and studies on the socio-economic dimensions of ICT use.

However, my own experience at the University of the Western Cape (UWC) suggests that we ask two prior questions before assessing the impact of ICTs on

teaching and learning. First, are the existing ICT resources adequate, and second, are all students able to adequately access and use the existing resources?

Over the past seven years (1997 – 2003) that I have spent as a student at UWC, one disturbing and frustrating feature of this campus is the level of access to computer resources. Students often wait in long queues inside computer laboratories before a computer becomes available. This situation has led, on numerous occasions, to students not even bothering to go to these laboratories due to the time they spend waiting for an opportunity to access a computer.

Therefore, the primary motivation for this study was the observation of long queues at computer laboratories. This led to a second motivation for the study, which is a growing concern for the way in which students are using computers and the extent to which the university is dealing with the barriers to access and usage. Another factor worth considering was that although UWC is a residential university, there were no computer facilities at the residences (at the time of writing).¹ This condition meant that students were unable to access computers at night and over weekends. It is important to note that some of the residences are on or close to the main campus; thus, the assumption may be that students could walk to these computer laboratories, but they are not always open. Finally, this study was also inspired by a larger ICT

¹ Towards the end of the 2004 academic year, a computer laboratory for postgraduate students was opened at the Hector Peterson residence. It does not form part of the study.

project that seeks to investigate how to “enhance quality and equity in Higher Education through the innovative application of ICT”.²

Omar (2003) refers to ICT as those technologies that enable the handling of information and facilitate forms of communication. For the purpose of this study ICT will be used to refer to computers (and their use for Internet surfing, word processing, chat room, discussion groups, drawing, publishing online, programming and designing) in computer laboratories on campus, which are primarily designated for student use.

This study examines how issues of access and use play out at the micro level of a historically black tertiary institution in South Africa. In doing this, the study investigates how “conditions of access” contribute to the manner in which students are using computers. The data I will present supports Burbules and Callister Jr.’s (2000) assertion that these “conditions of access” at the institution influence the manner in which ICT resources are managed, accessed and used.

The “conditions of access” are situations that would either restrict or enable participation (Burbules and Callister Jr. 2000: 20). The study uses the term access to refer not to the “thin conception of access”, which only looks at the physical infrastructure, but to a “thick conception of access”, which focuses on all factors that

² A cross-institutional project in the Western Cape funded by the Carnegie Corporation called ICT in Higher Education led by the University of the Western Cape but including all five institutions in the Western Cape.

actually affect who can take full advantage of access in an effective way (Burbules and Callister Jr. 2000: 21). These factors would include looking at the availability of infrastructure, everyday lab practices, training, operating times as well as students' ability to engage with the computers. The above-mentioned factors are used in this study to refer to the "conditions of access". Bridges (2001) refers to "real access", while Warschauer (2000) argues for "social inclusion and enabling resources". On the other hand, "use of computers" will refer to the possible ways in which the institutional conditions of access (to computers) can function to facilitate or restrict usage. While I will also examine what students do with computers when they have access to them, it is important to note that this study foregrounds access as its primary focus.



This study therefore investigates the multiple ways in which the relationship between "access and use" is mediated by the power dynamics of institutional decision-making around policies, the physical location of ICT resources, everyday institutional practices and rules, etc. This study argues that it is these everyday institutional dynamics, that eventually affect whether and how ICTs will be used, by whom and for what purposes. Meaningful access to ICT is crucially dependent on the local institutional framework. In the UWC context, I will argue that the local 'conditions of access' would include institutional arrangements and lab practices which shape both the manner in which these resources are accessed and also determine who has access to them, when they have access and where they have access.

Research questions

The primary research question is: Are students able to adequately access and use the existing ICT resources at UWC? I will approach this question by asking several sub-questions:

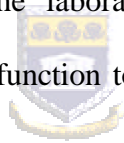
- What ICT resources are available to students at UWC?
- Are these resources organized in ways that provide adequate access to students?
- Who accesses the ICT resources by faculty, race, gender, residential/ non-residential, fulltime/part-time, level of study?
- What kind of barriers/obstacles to access and use of computers do students encounter?
- What do students think can be done to improve their usage of computers?
- What are these resources used for (academic/ non-academic work)?

Conceptual framework

This study will add to the “digital divide” literature. Whereas the early literature on the digital divide pays more attention to unequal access to physical resources, recent studies (e.g. Warschauer 2002, Gurstein 2003, Miller 2001, Dorr and Besser 2002, Czerniewicz and Brown 2004) acknowledge the crucial importance of a broader conceptualisation of access than just access at a physical level. These recent perspectives move beyond purely distributive models by emphasizing the multiple

ways in which the relationship between access to and use of networked computers is mediated by a variety of other factors. These would include human resources, which would be able to use and deal with the complexities associated with extensive usage of these resources. While access to physical resources is a crucial aspect of access, it is not on its own a sufficient condition for meaningful access.

This study examines two sets of institutional conditions (among a host of others) that mediate the access-use relationship in a higher education institution: (a) the institutional arrangements for the distribution of computer labs on campus, and (b) specific practices in computer labs. I argue on the basis of my empirical findings that the distribution and location of the laboratories on campus and the specific laboratory practices and regulations function to inhibit the use of ICT resources by students.



Significance of the study

The study presents the institution with data that shows a broader picture of institutional arrangements of computer laboratories, micro political practices of computer laboratories and patterns of access and usage of computers by students. Moreover, it provides various theoretical perspectives and empirical data that the Teaching and Learning Technologies Unit (TLTU)³, the Information and

³ This unit ceased to exist from 1 March 2004 and its duties have been distributed among other units who are part of ICS, but it will be kept as is for this study because when data was collected, it still existed.

Communication Services (ICS) department and various computer laboratories can use to improve the services they are rendering to UWC students.

The structure of the study

This study is divided into five chapters. The first chapter provides a background to the study, the motivation for the study and outlines the framework around which this study will be built. Chapter Two develops a theoretical framework to understand the concepts of access to and use of ICT with a specific focus on students.

Chapter Three describes the research design and methodology. This includes the research instruments that were used during the investigation, and the processes of data collection and data analysis. Lastly, this chapter points to the limitations of the study. The fourth chapter discusses the research findings in relation to the conceptual framework developed in the former chapters. Chapter Five provides a conclusion to the study.

CHAPTER TWO

THEORETICAL FRAMEWORK

This section reviews the debates and frameworks in the literature on access to and use of computers by students in higher education institutions. It begins with recent policy discussions on the importance of ICT in higher education, and then considers the ways in which different levels of access are discussed in the digital divide literature. The last section of this chapter locates the study in a conceptual framework, drawn from the reviewed literature.

Higher education terrain



According to the Education White Paper 3 on higher education (DOE, 1997: 10), higher education should, “promote equity of access and fair chances of success to all who are seeking to realize their potential through higher education, while eradicating all forms of unfair discrimination and advancing redress for past inequalities.” Then again, education might probably be playing its role in the form of “opening the doors of learning to all” (Freedom charter) to the previously disadvantaged and those ‘seeking to realize their potential through higher education’ (Education White Paper 3 on HE, 1997). But then higher education in general and UWC in particular, face many challenges in the provision of ICT resources to its students.

Higher education must, in order to meet these challenges, “lay foundations for the development of a learning society which can stimulate, direct and mobilize the creative and intellectual energies of all the people towards meeting the challenge of reconstruction” (Education White paper 3 on HE, 1997: 3). These goals are clearly linked to the said opportunities and potential of ICT use in education (Taylor 2000, Wheeler 2000, Lundall and Howell 2000, Hall 2000).

This line of thought from the White Paper on higher education is in line with UWC’s mission statement (see Appendix B), which states “to further global perspectives among its staff and students, thereby strengthening intellectual life and contributing to South Africa’s reintegration in the world community and assist educationally disadvantaged students to gain access to higher education and succeed in their studies.” This suggests that UWC has to first acknowledge that, for instance, basic education in South Africa has not been equal, so students that enter the institution do not possess the same technical and academic capabilities. However, the focus of this study will not be on who has these skills or not; the study will look at differential access to ICTs by different student groups of UWC.

The above policy focus suggests that UWC allocate and provide full access to resources (including ICT resources) to ensure that students acquire membership to the global communities through collecting, creating and disseminating information. This vision is, in fact, embedded in the Integrated Information Strategy for UWC (2003: 1), of which two of its goals are to:

- Provide and promote the technology to enable UWC to produce graduates who are able to use technology to find, understand, apply, analyse, synthesize, evaluate and report on information from a wide variety of sources and who are competitive for the twenty first century careers.
- Provide and promote the technology to enable UWC to strengthen its participation in the global academy of scholarship, and build a world class research and publication profile while producing postgraduates who are internationally competitive in their fields.

ICT, therefore, has a huge role to play at UWC, in particular, to ensure that the goals of the Integrated Information Strategy are fulfilled and become a reality.



The importance of ICT

There is a large body of research (Hall 2001, Taylor 2000, Wheeler 2000, Burkle 2001) on the benefits of ICT for the learner and teacher in the classroom. Omar (2003) further makes the assertion that there are advantages of using computer technology to accomplish teaching-related tasks. The development of globally linked networks driven by the Internet provides immediate access to the global resources around the world. Omar (2003: 11) argues that, “Access to and effective use of information and communication technologies and knowledge will be the critical determinant of successful and sustainable development for individuals and communities as we enter the 21st century”. This argument therefore recognizes the

importance of allowing even remote communities to become integrated into the global networks of information and knowledge through access of ICT. However, in order for individuals and communities to prosper and realize their potential, the challenge is to have access and be able to use ICT effectively.

Wheeler (2000: 26) notes that, “ICT is central to communication, to the storage and retrieval of information and knowledge, and also the fact that the library is being revolutionized by web-based information systems of many institutions, bears testimony to ICT’s important role”. However, it is crucial to note that “access to ICT does not in itself make people any more likely to participate in education or engage with learning and knowledge production” (Corbett & Whillms, 2002: 10). This quotation acknowledges an important part of my argument which, in fact, states that the university should not only provide infrastructure but also look at the institutional practices which regulate the use of these resources and to what extent these resources are used to benefit the students.

As noted above, ICT can be applied to a full range of human activity from personal use to business and government as well as higher education. As Miller (2001: 10-11) suggests:

ICT is multifunctional and flexible, allowing for tailored solutions – based on personalization and localization – to meet diverse needs. It is a key enabler in the creation of networks and allows those with access to benefit from exponentially increasing returns as usage increases i.e. networks externalities especially higher education.

ICT fosters the dissemination of information and knowledge by separating content from its physical location. This flow of information is largely impervious to geographical boundaries. ICT is global, through the creation and expansion of networks, it transcends 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, without regard of nationality, and challenging current policy, legal and regulatory structures within and between nations.

Therefore, whilst understanding the importance of ICT, it is equally crucial that we acknowledge the existence of different levels of access to ICT. The next two sections examine debates in the digital divide literature around the different levels of access to ICT.



The digital divide

A debate about access and use of ICT has evolved around the notion of the ‘haves’ and ‘have-nots’, which has been termed the digital divide. Ryder (2003: 24) describes the digital divide as “a problem of multiple dimensions, which refers to the gap between those who can effectively benefit from information and computing technologies and those who cannot”. Similarly, Gurstein’s (2003: 9) definitions below capture these digital divides in terms of geographical location, level of education, class, nation state, and so on:

The term digital divide describes the fact that the world can be divided into people who do and people who don't have access – and the capability to use – modern information technology, such as telephone, television or the Internet. The digital divide exists between those in cities and in the rural areas, between the educated and uneducated, between economic classes and globally, between the more and less industrially developed nations.

The digital divide further refers to the gap between individuals, households, business and geographic areas at different socio-economic levels with regard to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities”



Burbules and Callister Jr. (2000) and Warschauer (2002) agree with Gurstein (2003) on other criteria which could be seen to contribute to the digital divide. For example, while providing the above two definitions of the digital divide Gurstein (2003: 8) argues that the gap between the ‘haves’ and ‘haves not’ is based, firstly, on the technical aspect.

The second aspect, which is the gender aspect of the divide, deals with the notion that there seems to be imbalances in the manner in which male and female engage with the ICT resources. Thirdly, the political aspect refers to the will of those who have the power to control how and to whom ICT is disseminated. Fourthly, self-decision refers to the same notion of the ‘thin conception of access’, as it relates to

the individual choice to engage with ICT; and lastly the linguistic and literacy refers to the form and content, which is also noted by Burbules and Callister 2000.

While Gurstein (2003) emphasises the socio-economic issues of the digital divide, Warschauer focuses mainly on the social aspect as well as the cognitive side of adaptation towards an effective engagement with ICT. Warschauer (2003: 3) further refers to the digital divide as a “social stratification due to unequal ability to access, adapt and create knowledge via use of information and communication technologies”. Therefore digital divides refer to unequal Internet access and usage as well as the unequal ability to make use of the Internet. This might be due, not only to unequal access, but to other factors like literacy, language and content. Similarly, the concluding section of the Draft White Paper on E-education (2003: 7), provides this tentative summary for the digital divide:

It is not only about connectivity and infrastructure disparities; it is also about local content... collective knowledge generation... improving Internet access and educational offerings in schools, and colleges, creating digital libraries for universities, overcoming cultural inhibitions... and collaboration between different sectors... ICT is a core feature of innovation and competitiveness.

On the basis of these readings and acknowledging the different angles from which the digital divide is viewed, and the differing interpretations of access and use, it is clear that for effective engagement with ICT, an institution of higher learning should be able to make sure that the infrastructure is fit for the purpose (resources

adequacy), human resources are well developed (skills training), and social support systems (institutional practices) are in place.

The focus of this study is on the distribution of the institutional ICT resources and on the laboratory practices, which I argue influence the degree to which students are able to access and use these resources. The next section examines the notions of thin and thick access to refer to these different levels of access.

Levels of access to ICT

There is a vast literature on what ICT can and cannot do. The optimistic rhetoric supports the idea that ICT can and will raise standards if used in carefully designed ways. In other words, if ICT were used as a means and not an end, it would yield positive results. Thus, the belief is that this technology should not take away the valuable face-to-face and emotional contact, but it needs to be fully integrated with the current ways of teaching and learning.

It is important to note that researchers who have dealt with the notion of access tend to agree on at least one level of access: physical or technical access. We can approach the concept of physical access from different angles, including availability, connectivity and affordability of technology and whether the technology is appropriate for the role it is supposed to play. However, most authors agree that physical access alone is insufficient and cannot adequately solve the issue of access

and use. Commenting on this issue, Miller (2001: 2) has noted that, “access to technology and availability of infrastructure to facilitate its use are undoubtedly the most important and first important steps, but this type of access alone is not enough to address the problem”. Dorr and Besser (2002) have also noted that connectivity holds layers of complexity beyond simple access to a computer. However, it is equally important to note is that this physical access, in many instances, is not unproblematic for all; among notable groups who face barriers to access are the disabled.

Ryder (2003) identifies two levels of access, which are: 1) the technical aspect, referring to the availability of infrastructure, the hardware and the software; and 2) the social aspect, referring to the skills required to manipulate the technical resources. Warschauer (2002), Burbules and Callister Jr. (2000), and Bridges (2001) argue that there are many types and levels of access.

Identifying different ‘layers of complexity to access’, Burbules and Callister Jr. (2000) refer to the quality and quantity of access to ICT through an examination of ‘thin and thick notions of access’. The ‘thin notion of access’ is viewed as a first step namely the technical aspect, which focuses on whether there is a desktop, network point connection and a chair for a prospective user. The ‘thick notion of access’ moves away from a sole focus on physical access, and argues for a comprehensive analysis of the different requirements that are essential for successful

use. According to (Burbules & Callister Jr. 2000), “thick conceptions of access ask not only about ‘access for whom’; they also ask about ‘access to what’ and for what purposes”. These are very important questions to ask in regards to students who have access to computers.

Burbules & Callister Jr. (2000) refer to four aspects of access, which are 1) technical; 2) skills, attitudes and dispositions; 3) practical aspects; and 4) form and content aspects. Warschauer (2002) on the other hand, refers to these levels of access as physical, digital, human and social aspects. Below I examine these levels.

As noted above, the physical aspects of access are part of a complex array of factors and relationships even though the latter three factors depend on the physical availability. Human resources refer to the knowledge, skills and attitudes that individuals possess for personal and social development (Warschauer 2002: 4-5). Social resources refer to the “benefits that one can potentially receive from participating in communities and networks, social networks that would assist people in gaining access to and make meaningful use of information and communication technologies” (Warschauer 200: 7). It further refers to “moving beyond issues of social life that actually influence who has time and opportunity to engage in work and play online” (Burbules & Callister Jr. 2000: 24). Digital resources refer to the “digital material that is made available online” (Warschauer 2002: 8). Burbules and Callister Jr. refer to these digital resources as form and content.

While these factors are important, Czerniewicz and Brown (2004: 2) suggest another factor for consideration when they argue that, “ICTs do not have any meaning in isolation – they have meaning in relation to an implicit or explicit purpose. That purpose is the way they acquire meaning; this in turn contextualizes them”. Warschauer (2000: 8) then provides an example of a project in India where computer monitors were put in walls and children mostly used them for computer games and drawing of pictures and not for the desired outcome of learning in a scholarly format. However, the vast literature on learning through play may contest this perspective.

It is therefore clear that there is a relationship between access and use. But obviously access cannot lead to usage if there are barriers. If the content is not relevant and alien to potential users, and if they also lack the necessary skills to effectively make use of the resources, they might find other means to engage with the resources. This clearly raises the issue of capacity and literacy. Warschauer (2000) notes that capacity and basic literacy are essential to surf the Internet, although reading, writing, language and thinking skills are essential if users are to maximize their ability to find, adapt and make use of online information. Clearly, though, ICTs cannot be equated to the Internet but rather the latter forms part of a crucial aspect of ICT. Conversely, Warschauer’s example further strengthens the argument by Burbules and Callister Jr. (2000: 19) that, “users who cannot participate effectively

across a full range of opportunities that the Internet represents cannot be said to have access, even if they have computers and online connection”.

In conclusion, the literature reviewed here suggests that it is crucial to understand that access has different aspects, which institutions of higher education need to consider when providing ICT for students. The specific institutional conditions of access can either inhibit or facilitate optimum use of ICT resources.

Framework of the study

This study is framed around the interplay of two themes relating to computers at the University of the Western Cape: access and use. The draft e-learning strategy of UWC recommends that the use of ICTs in teaching and learning be supported by training and an on-going support of students and staff. This document identifies three important components of access that act as filters: institutional readiness, physical access and epistemological access. The e-learning strategy document understands institutional readiness to “relate mainly to institutional processes, investment in staff with appropriate competencies, and the maturity of academic staff in particular with respect to taking on the responsibilities with respect to e-learning” (Keats et al. 1999: 7).

This study will build on and add to the above framework, especially with reference to two of the above factors: institutional readiness and physical access. The crucial

aspect of epistemological access, understood as “determining the degree of understanding of technology, the skills to use it effectively in order to construct knowledge and produce meaningful learning” (Keats et al. 1999: 10) will not be considered for this study. This study concentrates specifically on investigating the ways in which institutional practices (e.g. availability of support for students, booking systems in the computer laboratories and the operating times) and institutional arrangements (e.g. location of computers, resource adequacy and the availability of resources) mediate the relationship between access and use of computers.



CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This section describes the process of data collection and analysis. It includes a discussion of the instruments that were chosen and reasons for choosing those instruments. The limitations of the study are also explained.

Data collection

In examining access to and use of computers among students of UWC, this study used a combination of quantitative and qualitative research methods. Data collection involved a letter (see Appendix A) requesting students to fill out a questionnaire (see Appendix C), in six computer laboratories on campus. Data collection also involved interviews with university staff directly involved in the ICT field (see Appendix D and E). Policy documents (government and institutional documents) and institutional statistics were also collected from relevant sources. The data collection for this study ran for a period of a month from mid-May until mid-June 2003.

Survey

The surveys were administered at six computer labs across the UWC campus: the writing centre computer lab, economic and management sciences walk-in lab, education faculty lab, law resource centre computer lab, the Thintana walk-in lab and the Win lab (of the science faculty). My observation of the use of computers at UWC

prior to this study made me believe that these computer laboratories were the most used by students, hence they were chosen for the process of data collection.

The survey constituted the primary research tool, especially on the usage and access, as well as barriers to access. The first section collected demographic details on respondents and focused mainly on their age, gender, race, level of study, employment status, residential status and the faculty where enrolled. The second section of the survey focused on students' perceptions about access to computers, what they used them for, whether they had sufficient time for using these computers, and the kinds of problems they encountered, whether there was adequate assistance in solving those problems and whether there were enough computers to use. The last set of questions in this section solicited their views on how the situation could be improved.

Data collection by means of a survey is quantitative. Quantitative research is used to answer questions about relationships among measurable variables in order to explain, predict and control phenomenon. The choice of survey research as the methodology arose from the special features that it offers (Babbie & Mouton 2001).

- It saves time and money without sacrificing efficiency, accuracy and information adequacy;
- It permits the collection of data from large numbers of respondents in relatively short periods of time

- Data from surveys are normally more suitable than those from other research methods for making generalizations concerning large populations; and
- It offers anonymity and avoids interviewer bias.

The main disadvantage of this form of information gathering, as Neuman (1997: 272) notes, is that “no one is present to clarify questions or to probe for more information when respondents give incomplete answers. Incomplete questionnaires then become a problem. The absence of a researcher means that there will be no observation of the respondent’s reactions to questions, physical characteristics or setting. Another shortcoming of this technique is that anyone can answer the questionnaire”.



In addressing these issues, I made sure that during the time the students were filling out the questionnaire I was in the computer laboratory to clarify questions if necessary. Unfortunately, there was little to do with incomplete questionnaires, unless I considered the incomplete questions to be significant. Lastly, because the questionnaires were filled out and left in the respective computer lab, this limited assistance from other parties when answering the questionnaires.

Through random sampling, I administered 250 questionnaires in six computer labs. 214 were completed and returned. These questionnaires were administered to those students who were found in the computer labs during the periods when I was allowed

to visit the laboratory to conduct the research. This would normally take between 5 and 10 minutes. Initially 200 questionnaires were administered, but due a lack of a racial representation and to the low number of responses from students in the Science faculty, I decided to increase the sample size. A second batch of 50 questionnaires was administered in the Natural Science computer lab. The anticipated effect was that this would increase the demographic representativity and the number of responses from students in the Science faculty. Unfortunately, although the latter happened, the final sample was not racially representative. However, I do not feel that this factor decreases the validity of my study significantly.

It should be noted, though, that the issue of time for students to fill out the questionnaires was a difficult one to address. This is simply because of the laboratory practices of regulating time spent on a computer by a particular student. This also meant that while students were completing the questionnaires, their time was being consumed, and no provision was made in most laboratories to compensate for the lost time. This was with the exception of the education faculty computer lab, which does not regulate time spent on a computer.

Interviews

The interviews constituted the major research tool on the issue of distribution as well as on identifying barriers to access and usage of computers, and how the institution is dealing with the barriers.

I conducted eight interviews with two senior management staff, two Teaching and Learning Technologies Unit (TLTU) staff members and the last four with the computer lab managers. The first schedule (see Appendix D) was designed for the senior management in the ICT field, the decision makers. The second schedule (see Appendix E) was designed for the lab managers and also TLTU staff who work directly with the students on a daily basis.



Data collection through face-to-face interviews provides in-depth information. This strategy allows the researcher to probe and investigate in more detail than with questionnaires, for instance. As a qualitative research method, interviews may be understood as a form of knowledge construction site. This is a more flexible method of information gathering, as Babbie and Mouton (2001: 425) state:

Qualitative interviewing is an interaction between an interviewer and respondent in which the interviewer has a general plan of inquiry but not a specific set of questions. It is necessarily and essentially a conversation in which the interviewer establishes a general direction for a conversation and pursues specific topics as raised by the respondent.

Interviews allow the researcher to observe the surroundings and also to use non-verbal communication as well as visual aids to gather information. As Krieger (1995: 4) suggests, “an interview is literally an *inter view*, an inter change of views between two persons about a theme of mutual interest. The researcher listens and hears people express their views and opinions in their own words, learns their views on their work situation, their dreams and hopes”.

The disadvantage of this type of information gathering generally involves a small sample and the responses given by a subject may be biased and affected by his or her reaction to the interviewer. In addition, the interviewer’s appearance, tone, voice, and question wording may affect the respondent (Nueman, 1997: 273).



Data analysis

Data analysis is a search for patterns in the raw data. This study has used two methods of data analysis. The first phase of dealing with data was capturing the survey responses in a spreadsheet and then into SPSS. This was used only as descriptive data and not for cross tabulation.

The second part of the analysis involved the coding of the interview data into themes of access and usage of computers by students. This was done after the transcription of the interviews and the personal notes taken during the interviews. This phase facilitated the review, examination and reorganization of these themes to capture

major issues. Linkages between usage and access that arose are discussed in the next chapter.

Limitations and corrective measures

The major limitation of this study was the scope of the research, as it could not allow for a closer investigation of the emerging themes. The inherent trend towards interviewer bias and the limited nature of the questionnaires are reasons why two methods of data collection were included in the study. Finally, the limited sample size suggests the need for further research.



CHAPTER FOUR

DISCUSSION AND ANALYSIS

This chapter analyses the empirical data in relation to questions around students' access to and use of computers at UWC. The argument I will develop in this chapter is that the 'conditions of access' – evident in specific institutional arrangements and laboratory practices – may sometimes function to restrict the optimal use of ICT (computers, in my study) at the computer laboratories at UWC. These conditions would include the location of computer laboratories, the opening and closing times (operating times), the booking system and the multi-usage of computer laboratories (for computer training, teaching and open-usage by students). Moreover, these institutional practices determine access to and use of computers. I argue that these practices influence the degree to which students will or will not use computers in the computer laboratories.

Access to Computers

This section addresses two questions: what resources are available? Are students able to adequately access the available resources? I address these questions by considering the institutional arrangements for the location and distribution of computer laboratories, and the factors influencing the extent to which students are able to adequately access the existing resources.

Institutional arrangements

This section discusses the data in relation to the physical access to ICT resources (what is available to students, and where and how resources are distributed across the UWC campus), and to specific laboratory practices (opening times; booking system).

Location of computer labs

UWC has a number of computer laboratories; some are centrally situated, while others are in faculties and departments, with the majority in the Science and EMS faculties. The ‘power of ownership’ determines how and when they are accessed and used. Therefore many students experience problems in getting access to computers.



The physical location of computer laboratories can affect how often students access and use a computer and for what purposes. Computer laboratories at UWC are generally faculty based (see Table 1 below) with the Faculty of Science having the advantage of thirteen computer laboratories with 391 computers. The Faculty of Economic and Management Sciences follows with five computer laboratories housing 161 computers and then the faculty of Arts, which has two computer laboratories with 65 computers. The three other on-campus faculties have one laboratory each for their students.

Table 1: Faculty-based computers

Faculty	Lab Name	No. Of PCs	Operating hours	Purpose of facility	Access regulation
Arts	Writing centre	45	08h30 –17h00	Teaching/Walk-in	All students
	LIS	20	08h30 –17h00	Walk-in	All students
CHS	CHS post grad	10	08h30 –21h00	Teaching/Walk-in	CHS post grad
Education	Education lab	22	08h30 –16h30	Teaching/Walk-in	Education post grad
LAW	Law resource lab	30	08h30 –17h00	Research/Walk-in	Law students only
EMS	IS lab	50	08h30 –22h00	Teaching (core)/Walk-in	IS students only
	IS lab- post grad	30	24/7 private access	Teaching/Research	IS post grad only
	EMS walk-in	45	08h30 –21h00	Walk-in	All students
	Economics lab	11	08h30 –17h00	Teaching/Research	Economics post grad only
	School of Govt	25	08h30 – 20h00	Teaching/Research	School of Govt postgrad only
Science	Botany	30	08h30 –17h00	Teaching/Research	Botany students only
	Adock Ingram	48	08h30 –17h00	Teaching/Research	Pharmacy students only
	Win lab	61	08h30 –17h00	Teaching/programming	Computer Sc. Undergrad.
	Sun lab	56	08h30 –16h30	Teaching	Computer Sc. Undergrad
	Net lab	17	08h30 –16h30	Teaching/Research	Computer Sc. Students
	Honours lab	20	24/7 electronic access	Teaching/Research	Computer Sc. Honours
	Yellow submarine	10	24/7 electronic access	Research	Comp. Sc. Post grad
	Post-doc. Lab	10	24/7 electronic access	Research	Comp. Sc. Post doc.
	ADM lab	52	08h30 –22h00	Teaching/Research	Stats U/G& part-time
	Maths lab	50	08h30 –17h00	Teaching/Research	Maths, Comp. Sc./Physics
	Stats post-grad	15	08h30 –17h00	Teaching/Research	Stats senior
	CB lab	14	08h30 –17h00	Teaching/Research	Med. bioscience only
	Anatomy lab	18	24/7 electronic access	Teaching/Research	Anatomy students
Total		689			

Source: Teaching and Learning Technologies Unit- March 2004

With the exception of the faculty of Arts, all these computer laboratories are department based; this is supposed to regulate access to these laboratories. This regulation is mostly done through electronic devices (used to open the laboratory doors) that are only obtainable for students of that particular department (see Table 1 above).

Table 1 shows that these computer laboratories are used for three specific purposes: teaching (computer literacy classes), research and as walk-in laboratories. Because there are few walk-in laboratories, most of them are used for teaching as well as walk-ins. This is where students use computers for typing assignments, accessing e-mail, surfing the net, chatting, drawing, programming, designing, publishing online, finding information, and other ICT-related activities. Note that Table 1 excludes the Dentistry faculty as it is based off-campus and no data was collected there.

It is worth noting that, although the Science faculty has the most computer laboratories, it is the only faculty that does not have a walk-in laboratory that provides open access to all UWC students. As explained above, most of their laboratories use electronic devices to control access, making it difficult for students from other faculties and departments to enter, especially undergraduates.

In addition to the faculty-based laboratories, there are three laboratories in the library with a total of 90 computers, and three in the TLTU with a total of 139 computers.

The Thintana laboratory, housing 70 computers, is the central walk-in facility accessible to all students. Table 2 below shows that any students may use the Thintana walk-in lab when other laboratories are engaged due to teaching. The computers in the library are only open for training and for academic searches.

Table 2: Non faculty based computer laboratories

Non – faculty labs	Lab name	No. of computers	Operating hours	Purpose of facility	Access regulation
Library	Level 5	15	09h00-21h00	Academic searches	All students
	Level 6	40	09h00-21h00	Academic searches	All students
		35	09h00-21h00	Training/ Teaching	Faculty bookings
TLTU	Thintana walk-in	70	08h30-21h00	Walk-in	All students
	Thintana teaching	55	08h30-21h00	Teaching	Faculty bookings
	B 20	14	08h30-21h00	Teaching	Per group booking
Total		229			

Source: Teaching and Learning Technologies Unit

Tables 1 and 2 show that in 2004, there were a total of 918 computers in 6 central and 23 faculty-based computer laboratories at UWC.

Laboratories’ operating times

This section deals with questions that explored other conditions of access. These questions looked specifically at the manner in which the existing resources provide

effective access to students. In this regard the study solicited information about opening and closing times of the computer laboratories, and the problems that laboratory managers typically encountered during these operating times. As shown in Table 1, the opening and the closing times of the computer laboratories on campus vary widely by purpose for usage and also by level of study.

It is worth to noting that the operating hours of the different computer laboratories vary, but the general operating times seem to fall between 8h30 and 17h00, although there are some computer laboratories that operate until 21h00 or 22h00, such as the Thintana walk-in computer laboratory. There are five computer laboratories that operate none stop (24/7), however, these five laboratories use electronic devices as a means of access, which therefore locks out those students who are from other faculties and departments. These 5 laboratories are only available to postgraduate students (See Table 1).

This arrangement suggests that undergraduate students are only able to access and use a computer during the regulated operating times. It is evident that this system of access would be to the advantage of postgraduate students in the faculty of Science only, because of the number of computer laboratories the faculty owns (see Table 1 above). This arrangement, however, raises questions about whether the policy guiding these laboratories had considered the multiple needs of undergraduate students who might want to use computers at any other times besides the normal

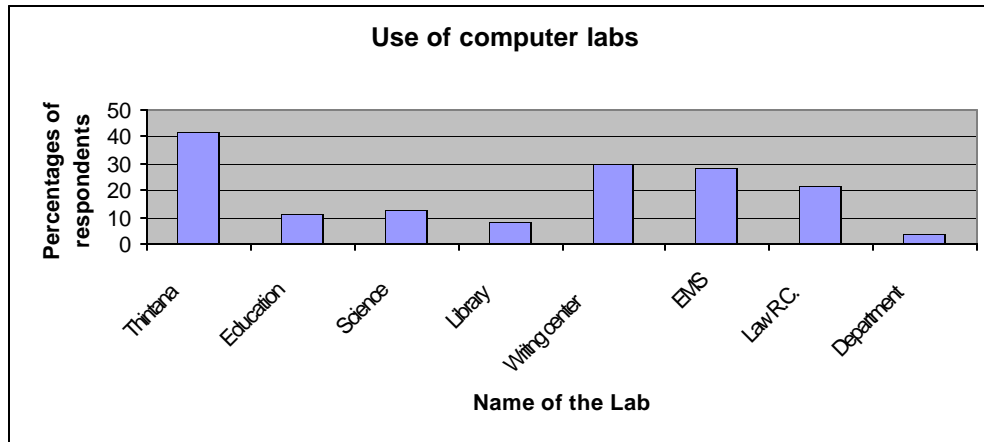
office hours. Undergraduate studies lay a foundation for postgraduate studies; therefore students should be familiarized with computer facilities from the lower academic levels.

The diagram below illustrates that the Thintana walk-in computer laboratory is the one most frequently used by students across all faculties. The EMS and the Writing Centre follow in terms of usage, although these have doubled usage as computer literacy class venues and also walk-ins. However, very few students reported to be using computers in their departments. This is probably because only 15% of my sample consisted of students in the Science faculty, which has the most computer laboratories in the university. The manner in which different institutions approach the allocation of computer facilities for their students is interesting. For example, if one looks at UCT where they have computer rooms allocated as special tutorial rooms for the same purpose as the computer literacy classes that UWC runs⁴, one observes that UCT avoids the doubled usage that UWC faces with its computer facilities.



Figure 1: The Use of computer labs by students

⁴ Information gathered from a HictE Reading Group seminar at UCT.



Source: Survey data 2003

The effect of this frequent usage of one lab was illustrated through the responses of the laboratory managers who felt that the operating times for the all laboratories should be extended. An ideal situation would be a laboratory that is open for at least 20 hours. Although this would not assist students not on campus residence but like the library that is situated on campus, there will be a facility that students can count on to be open when they need access.

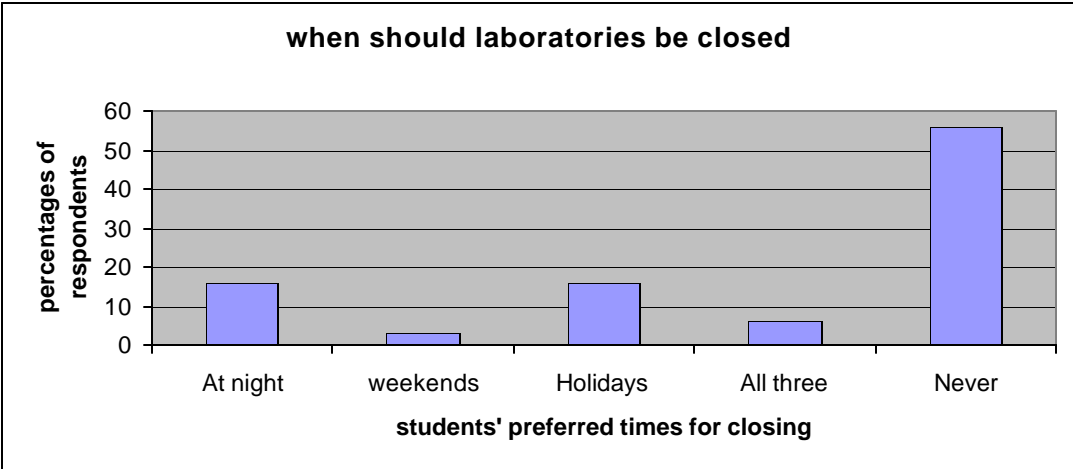
This is very important because of the realization that UWC caters for students from disadvantaged backgrounds, and who mostly do not own personal computers.

According to a laboratory manager:

Students differ due to their background; others haven't used the computer before, these students are very disadvantaged and they would sometimes learn by themselves (through interacting with the application). In the lab students are not allowed to play games and other things like watching porn.

Students expressed similar sentiments. Figure 2 below indicates students' responses when they were asked when computer laboratories should be closed. Most students felt that computer laboratories should not be closed at all.

Figure 2: When should labs be closed?



Source: Survey data 2003



At senior management level the feeling was somewhat different to that of students and laboratory managers; although there is an agreement that at some point a 24-hour laboratory should be put in place. At senior management level, it was clearly expressed that opening a 24-hour lab at this juncture was not a viable solution and that it would not necessarily deal adequately with the issue of expanding access to most, if not all, students. Although this was a predominant feeling, the suggestion to open a laboratory at residences that would operate 24 hours a day for seven days was welcomed, as one senior level manager noted:

...the last hour or two the labs are operating at full capacity, I think that's a first signal that we have to expand access, so we will be looking at leaving it open late in the

evening from next semester. I would be wary though of assuming that by doubling the amount of hours, we will be doubling the amount of access, there is a whole range of issues why all-night access on campus of labs might not work for everybody, I think it would benefit certain groups and not everybody.

However, according to some respondents, both in the interview and in the survey, since UWC is a residential institution, students at residences also need access to these facilities. In addition, some students might be employed and therefore cannot access these resources during the day. Moreover, residential students would benefit from this extension of laboratory hours since most do not have a personal computer in their residences. The same senior level manager also said:

I'm really interested in a project we are now developing around residences; there I think 24-hour access to where people live could really help. I'm not convinced that 24-hour access in the central campus is the route that could help everybody.

It seems there is tension between different stakeholders and how they view the issue of the opening and closing of computer laboratories. My findings illustrate that there is a growing need for computer laboratories to be open every day, for 24-hours. Other institutions, like the University of Stellenbosch and Cape Technikon⁵, as well as a few departments at UWC (see Table 1 above) currently adopt this practice. It is worth noting that in order for students to use computers, these resources need to be

⁵ Information gathered for the HictE project in the Western Cape. Cape Technikon now forms part of the newly established Cape Peninsula University of Technology

available to all students, and that other conditions of access are also not ignored, notably the booking system discussed below.

Booking system

All computer laboratories have different rules on what, how and when computers can be accessed and used. Most of these laboratories have a booking system, where students reserve a computer for a certain time of a particular day. This reservation depends on whether there is a class or not, and also on the type of usage. In most laboratories students are allowed to use computers for an hour to access the internet only, or for two hours for both the Internet and word processing. The fact that most laboratories have double usage (teaching and walk-in) means that many students do not have access to computers when required, leading to the commonly held view that there is an inadequate number of computers for general use by students. This view is captured by one of the laboratory managers who said:

Basically, there is a lack of facilities. The number of computers is a problem at UWC. If you look at the student population versus resources, the number of computers is very limited. The computer lab is always full to capacity and other students do not find a place or a machine.

Despite these setbacks, all the computer laboratory managers interviewed were committed to assisting students, especially those who have problems with any aspect that could hinder those students from using computers. Most of these managers also act as computer literacy tutors. As one manager noted: "I do computer literacy, basic

teaching of the Microsoft packages to students at the university”. Similarly, another manager pointed out:

We are responsible here for teaching computer studies... we teach computer education to postgraduate students, certificate students... the first semester we concentrate on introduction, basic internet, how to apply the internet for producing resources to teach with, then they complete modules using Office, the Office 2000, where we teach Power Point, Excel.

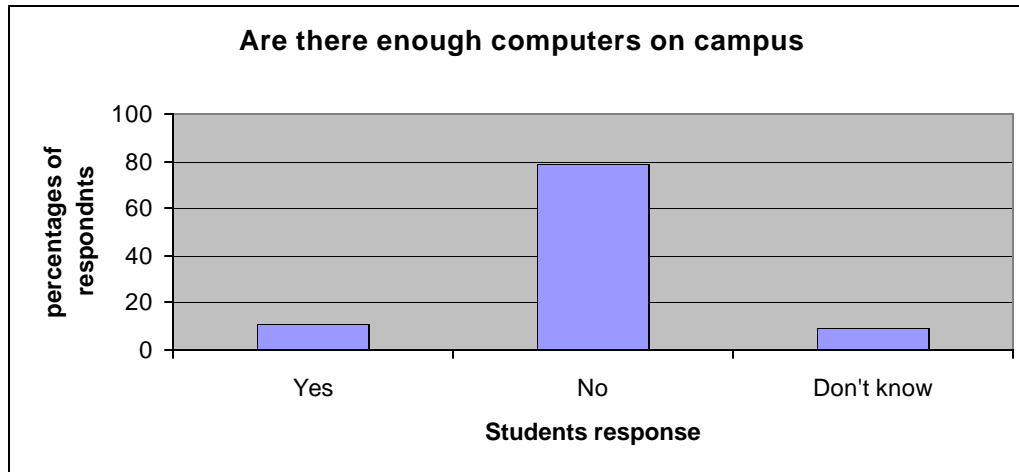
Resource adequacy

As stated in the first chapter, the acquisition of ICT resources at UWC has been a long-standing hurdle, largely dependent on donor funding. Survey participants were asked to respond to whether they felt that there were enough computers on campus. Students answered yes, no or do not know. Figure 3 below shows that 79% of respondents indicated that there were not enough computers and only 11.2% indicated that there were enough computers, while 9.3% did not know whether there were enough computers. The response of students in the first option agrees with the view expressed by the computer laboratory managers, as noted above on the number of computers at UWC.

On the whole, therefore, the adequacy of resources impacts directly on the hours that a particular student can spend on a computer. In most of the computer laboratories students are only allowed to use a computer for a maximum of two hours at a time, as noted above, for Internet usage, surfing and word processing with the exception of one laboratory where a signing-in

and -out format is used. One manger stated that there is a major need for new equipment, despite the financial constraints within their working environment.

Figure 3: Response to the availability of computers



Source: Survey data 2003




In this regard, my findings are in agreement with authors such as Adam (2001: 3) who, in the analysis of ICTs in higher education in Africa, noted:

Access to computers is limited. Current estimates show that there are about 4.5 million PCs in the continent. The distribution ranges from 1 per 1000 in some countries to 8 per 1000 in others. Where available, computers are mostly used for document processing. The student to computer ratios in higher education in Africa is as high as one computer for 200 students. This ratio is 1 to 10 in developed countries.

At UWC the ratio is 15 students to 1 computer⁶. On the face value, UWC is faring better than other African countries; but the data presented in this section suggest that

⁶ When you divide the number of registered students in 2004 by the number of computers (13478 by 918), it gives you 15 (rounding off of 14.68) students for each computer. Note that this overall ratio will differ across faculties, showing a differential access by faculty and department.

use of resources may also depend on the manner in which the existing resources are managed.

The major questions for this section have been about the available resources and whether they were adequate. The student to computer ratio of 15: 1 answers the first question. However the second question – are these resources adequate? – has two responses. Firstly, understanding the ICT challenges that face the African continent in general (Adam 2003) and based on the above-mentioned ratio, there seem to be adequate resources. Secondly, however, on closer inspection of the institutional arrangements, my findings suggest that several institutional practices function to restrict access in various ways through the booking system, lab operating times and the double usage of computer labs.  Therefore, although the institution seems to be providing physical access in terms of the above ratio, these other ‘conditions of access’ tend to act as barriers to accessing these resources.

Use of Computers

In this section I describe the student user profile, based on my survey. It looks at which students use the available computers and where. I then analyze the main purposes students use computers for when they do have access to them.

Student user profile

The characteristics of the sample of the study in terms of race, gender, age, faculty and level of study varied dramatically. The questionnaires showed that 59% of the respondents were female and 41% were male. This number reflects the broad enrolment figures for UWC in 2004: 58% females and 42% males (see Table 3 below). From the survey figures 53% of the students were between the ages of 20 –23 and 30% were under the age of 20. Those above 23 years made up the rest of the study.

Table 3: Overall statistics for UWC 2004: 27 Feb.

Faculty	Males	Females	Full-time	Part-time	colored	African	Indian	White	Other	Overall figure
CHS	544	1589	1932	154	1082	587	113	135	175	2133
EMS	1804	1822	2839	755	2022	955	300	44	245	3626

Arts	682	1299	1748	224	1011	693	68	48	108	1981
Dentistry	257	334	377	20	143	86	140	195	20	591
Education	212	312	177	345	304	141	3	13	38	524
Law	669	716	1149	235	849	353	98	30	41	1385
Science	855	854	1667	38	718	624	147	59	114	1709
Grand Totals	5023	6926	9889	1771	6129	3439	869	524	741	11949

Source: UWC administration (2004) Enrolment statistics: February 2004

Gender

Research relating to women and computers has traditionally emphasized the marginalisation of women in accessing and using ICTs (Finke 20002, Sullivan 2002, Robins 2002). Mizi (2003: 6) for example states:

Other factors constraining women's access to ICTs include time, cost, geographical location of facilities and social and cultural norms and women lack of computer and information search and dissemination skills.

However, recent studies point to the active engagement of women with ICT. For example, in their study of the use of walk-in laboratories at the University of Cape Town (UCT), Czerniewicz and N'gambi (2004: 244) note, "we did notice that almost two-thirds of those engaged in communication activities were female. Similarly, Atan (2002) has noted:

Female learners are equally optimistic that ICT is a technological tool that has become an important key that enables them to access knowledge to supplement their study materials and to assist them in the learning process through education (2002: 207)

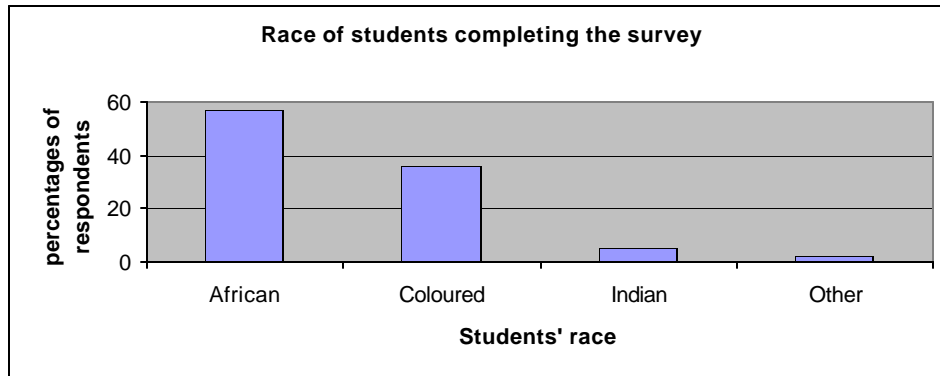
My survey with 59% female respondents suggests, in conjunction with the literature cited above, that the general perception that women (as a homogeneous group) are intimidated by technology in general and ICT in particular should be revisited, and that further research be conducted on this area.

Race⁷

Figure 4 below illustrates that during the times when the data were collected from the computer laboratories, the majority of the students who were using computers and took time to fill in the questionnaire were African students followed, by Coloured students and then Indian students. I compared these to the percentages in Figure 5 below, which shows percentages by apartheid classification of UWC student enrolment in 2004. Although only 30% African students are enrolled at UWC while 53% are Coloured students, the survey data shows that almost two thirds of students surveyed (57%) were African and just above a third (36%) were Coloured.

Figure 4: Distribution of students by race

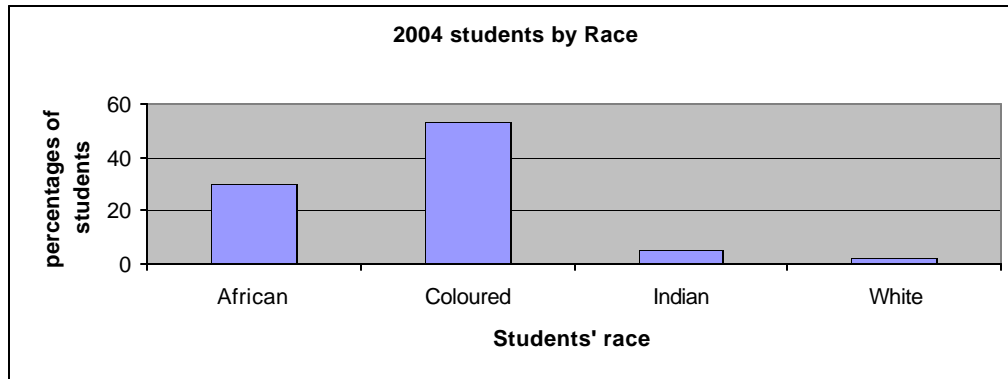
⁷ The apartheid racial categories are only used to clarify and not meant to be derogatory



Source: Survey data 2003

Having noted the above, it is also assumed that middle-class students have access to computers at home, thus, there is less pressure on them to use the computers available on campus. Obviously, this then becomes a class issue and not necessarily only a race issue, because students from well-off families from any racial category might be able to have access to computers whether at home or at a nearby telecentre. It should be noted, though that this by no means suggests that coloured students are wealthier than African students. This is merely used to try to make sense of the smaller numbers of coloured students in computer laboratories while there is evidence that there are more coloured students than African students enrolled on campus (see Figure 5 below).

Figure 5: Distribution of students by race in 2004



Source: UWC administration (2004) Enrolment statistics April 2004

On face value, therefore my data may suggest that more Coloured students have home computers and therefore do not use those on campus. Furthermore, understanding that in the Western Cape class and race are historically coincidental; I would therefore recommend that future research take note of these statistics, so as to understand why there are fewer Coloured students using the computer laboratories.



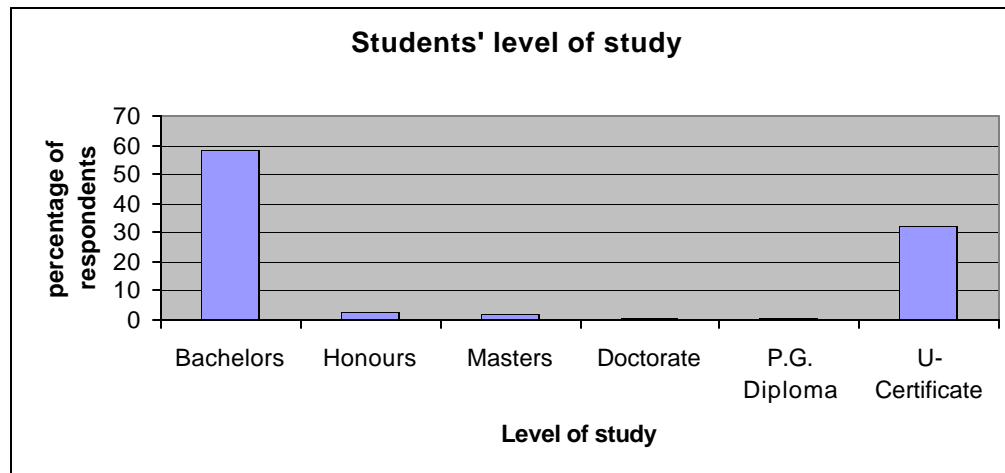
Level of study

In terms of the level of study of students, Figure 6 below illustrates that the largest group of students who completed the questionnaire were undergraduates (bachelors), followed by certificate students and then postgraduates students at different levels. This finding might suggest that postgraduate students are using computer laboratories that are always open (see Table 1 above) or there may be other possible explanations. However, the manner in which students make use of a computer depends on their level of study. For instance, laboratory managers noted that Masters students, compared to undergraduates, would spend little time on checking and

sending e-mails, but would rather spend their time doing research. This was noted in this manner:

You can see a difference between postgraduate and undergraduate students. What Masters students do is to send e-mail to contact family and then use the Internet for its resources.

Figure 6: Student's level of study



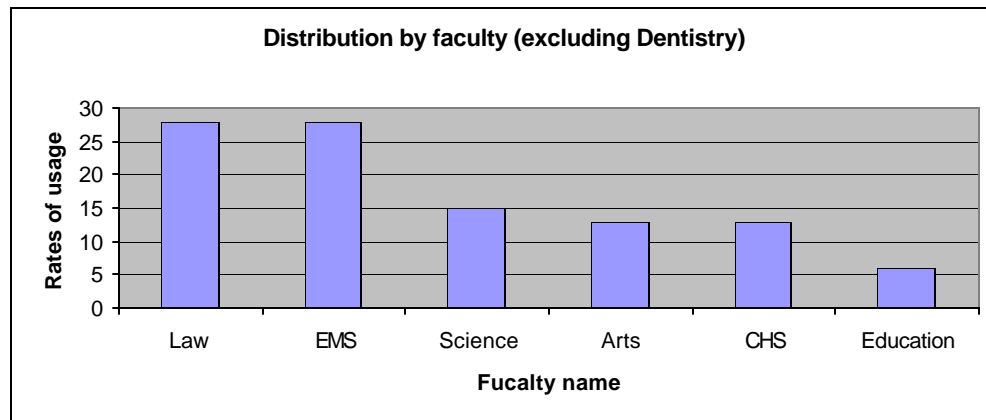
Source: Survey data 2003

The above distribution of students may be seen in the light of the location of computer laboratories around campus and the way in which these laboratories are run. My findings indicate (with the exception of those laboratories that use electronic devices to open) that although computer laboratories are faculty based (see Table 1 above), students are still using them even if they are not studying in that particular faculty or department, as one manager commented:

Even though this lab is meant for our students you will find that it is not only student from here that use this lab and you can't chase students away because you aware of the scarcity of resources on campus in general, unless the students are playing games.

The diagram below shows the demographics of the survey data according to faculty registration, as indicated by students.

Figure 7: Distribution of students by faculty (excluding the Dentistry faculty)



Source: Survey data 2003

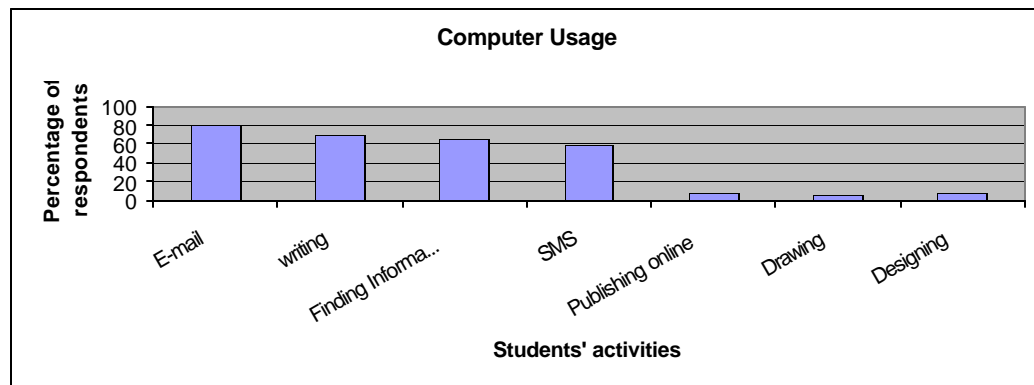
Students' computer usage

The data presented in this section shows that the use of computers varies in relation to the level and type of access. Some of these findings can be linked to the laboratories' operating times. Earlier, when I discussed the manner in which students were using computers, I noted that the concern for laboratory managers was that activities such as sending and checking of e-mail, SMSs, and any socially related Internet activity should be used to supplement students' studies (see Figure 8 below).

Selwyn, Gorad and Furlong (2003) in their study of home computers and university ICT use, have noted similar findings that:

Within the 52 percent of the sample who had used a computer, word-processing (writing) was the most popular activity, followed by file and memory organization. Sending and receiving e-mails was the most prevalent Internet based activity, alongside searching for information.

Figure 8: Students' computer usage



Source: Survey data 2003

Furthermore, one laboratory manager noted that:

On the negative side, what I see from the students, not only here but also on campus in general, is that students abuse technology, to a certain extent that they don't value what they have. They will waste time on SMSs and spend hours on SMS and chat. They don't use the full potential of the Internet and e-mail. If they want to chat, they can chat about educational things and other issues about community but they are not doing that, they just send SMSs to cell-phones...I'm not saying they should not but not at the pace they are doing it now.

The implication here is that largely communicative use of campus-based computer is illegitimate. It suggests that the university policy ought to regulate what should be available and how it should be configured. Therefore, I would recommend that there should be access to some computers for e-mail and other socially related functions and then others should be restricted to academic use. It should be noted though, that there is strong argument for playing and learning (Warschauer 2002). Moreover, the Internet itself was a product of this exploration.

Similarly, my findings from the open-ended section of the questionnaire reveal that most students who indicated that there are enough computers seems to be in agreement that in order to improve students' usage of computers, the university needed to:



“Limit them (students) from doing unnecessary stuff” and also to “control what they access” and this would limit the unavailability of computers for academic purposes because students are using them for entertainment (Survey data: 2003).

My findings further indicate that even the above mentioned group of students shared similar views with those who indicated that there were not enough computers (see Figure 3 above) and that the university should either make more walk-in labs available for students and/or the computer laboratories should open 24 hours. Most students shared this latter view as they saw this as one way through which the level of access to computers could be improved for students. A senior staff member,

responding to the same line of questioning noted the following about students' usage of computers:

I think you can start off thinking about reading it in three different ways. Firstly, I would say it's basic academic desktop technologies – these would include word processing assignments and searching for academic information; it's those basic technologies that are part of general academic work. Secondly, there would be advanced application of specific discipline; notably would be in the Science faculty and part of the EMS, there are applications that are specific for academic programs that define specific academic objectives, I would like to put things like SPSS (manipulation of data) there is a range of specialists needs determined by the departments. Thirdly, there is a community of communications, the SMS, contacting family, those are very valuable but they might not be highly related to their strict academic work, they are not related to completion of assignments. I hope we will continue to provide space for them because it's right those students keep their community together and its very valid use of the technology. Obviously within that such groups there are uses that are also relevant to the academic institution.

The above two views (from the open-ended section of the questionnaire and the interview with the senior staff member) do not necessarily differ, but the manner in which they both approach the use of technology is interesting. On the one hand the use of computers for E-mail and SMSs is perceived as not advancing the academic culture. On the other hand it is perceived as necessary as it has two roles to play. The first is to communicate with family as well as keeping the student community intact. The second is to communicate in order to complete certain academic tasks like an

assignment, for example. In a similar study conducted at UCT, Czerniewicz and Ng'ambi (2004: 44) noted this about students' use of computers for communication:

Almost all (86%) activities in this category were not directly related to courses the students were following. Yet these activities could not be considered entirely irrelevant...moreover, the effective aspects of learning cannot be ignored; communication activities that provide emotional support can be counted as necessary educational elements.


Obviously, there will be differences but on the whole one can argue that the usage of the computers to communicate with others is regarded in a positive light. My findings seem to be in agreement with Czerniewicz and Ng'ambi (2004) as they indicate that as many as 80% and 59% of the students in their sample of UCT students indicated that they use e-mail and SMS facilities respectively.

Most students in my sample indicated that there are not enough computers. A possible reason for this lack of computer facilities might be that those that are available are being used for social activities. For this reason, certain students felt that control mechanisms needed to be put in place to regulate the way they are using computers in general.

In conclusion, it is important that further research be conducted to explore the effectiveness of the manner in which these scarce resources are used and managed. Research should also look at ways in which the use of computers could be regulated

to ensure better academic usage. It should be noted, however, that as long as UWC has so many disadvantaged students without computer access at home, one will find them using campus facilities for communication. This should be recognized, and not just be regulated. It is up to the institution to block access to porn and other useless games to provide space for the above.

Barriers to access and usage

This section highlights the barriers to access and use that were identified, both at institutional and individual levels. Some of the barriers that both students and staff felt needed to be addressed so that students could make more effective use of computer resources, are as follows.  Firstly, at an institutional level, they felt that there is inadequate distribution of computers across campus. As one laboratory manager noted:

The number of computers is a problem at UWC. If you look at the students' population versus resources, the number is very limited. The computer lab is always full to capacity and other students do not find a place or machine.

According to the senior management staff, the institution has many priorities and the provision of more computer laboratories is but one of them. This, therefore, suggests that the institution will depend on donor funding to meet the desired outcome of providing more computer space. The Integrated Information Strategy (2003) argues that, to benefit from adequate access, aspects such as the availability of

infrastructure, hardware and software should be addressed first. Consequently, one hopes that the thousand computers donated to UWC, as recently reported in the official campus newsletter (On campus: 13 May 2004), will play a huge role in meeting this goal. Unfortunately, my findings show that the physical location of computer laboratories poses a major problem. Computer laboratories are far away from students. Only one postgraduate residence has a computer laboratory, but with twelve computers for more than three hundred students⁸.

Secondly, the way ICTs are used by students compounds the problem of inadequate physical resources. There should be ways to ensure that these computers do not end up being mainly used for social purposes (e-mail and SMS), but rather for academic purposes (although there are still questions in this regard). My findings also indicate that the access ratio is 15: 1, which, as mentioned could be translated as reflecting adequate provision. This, however, does not take into account the manner in which these resources are being used, like the fact that certain or most laboratories have double usage. There is also the booking system, which works on a “first come and first serve” basis.

It is for this reason that this study suggests that, for students to achieve adequate access, the institution has to address the ‘conditions of access’. This is availing adequate computer space and time for computer usage. The study also suggests that

⁸ This computer lab was built during the data collection period hence it was not included in Table 1.

curfew should be imposed on what students eventually use the computer for. In this way the institution would really be a 'place of quality and a place to grow'.

It has been pointed out earlier that it is not sufficient to only solve the technical side while little is done to improve conditions and provide an opportunity for the development of skills that would enable users to use the resources optimally. It has to be noted that this development of skills would also improve and be beneficial to students while surfing and searching for information in the Internet as well as in word processing. This has the potential of reducing the number of students who use the computer facilities mainly for socially related activities.



In conclusion, the barriers that students face include the inadequate distribution of computers by faculty and department, the double usage of computer labs (as walk-in and for literacy classes), the manner in which students are using these facilities, the lack of computer space at residences (with the exception of one postgraduate residence), and the limited time that students have on a computer.

CHAPTER FIVE

CONCLUSION

The research was set to investigate questions around themes of access and use of Information and Communication Technologies by students at the University of the Western Cape. This was to determine whether there are adequate computers and how students are using these computers at UWC. The study has illustrated that for effective use of ICTs, the ‘conditions of access’ need to be favourable to the students. The study argues, in line with other authors, that to achieve this, the institution should look at providing the ‘thick notions of access’ rather than mainly focusing at physical aspect, which is the ‘thin notion of access’. Clearly, one cannot begin to discuss access and use of ICT without the proper infrastructure, so physical access is important.

I have argued that at UWC, there are two lenses with which one can view ICT resources. On a general outlook, in terms of the ratio of 15 students per computer, then one would conclude that there is adequate allocation of resources. On closer examination, however, the unequal distribution of computers across faculties and the institutional conditions of access, which include the double usage of computer laboratories, the booking system, and the operating times, affects usage; therefore my conclusion is that the resources are inadequate. The study has further illustrated

that even if the technology is available, it does not on its own result in people using it. It becomes worse when conditions are not favourable to the even limited resources that are sometimes available, due to the institutional arrangements and lab practices.

My findings show the following: firstly, the institutional arrangements seem to favour two faculties, namely Economic and Management Science (EMS) and Natural Science. This means that students at these two faculties are better placed to have adequate access to computers. These findings also show that in residences (with the exception of one postgraduate residence), there are no computer facilities. These institutional arrangements affect the manner in which students access and use computers.

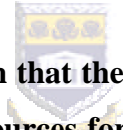


Secondly, the existing institutional practices support the argument that students cannot make effective use of computers because of time allocation. These computer lab practices are embedded in the booking system and the operating times of computer labs. My findings show that most students, as well as staff, would like to have computer labs that operate 24/7 and over weekends and holidays.

My findings indicate that the most prevalent usage of computers, when students ultimately have access, is sending e-mails and SMSs; the limitation of these findings is that one cannot ascertain the content of the e-mails and SMSs; nevertheless these

could be associated more with social activities. A significant number of students are also using computers for finding information and writing assignments.

The university has announced in the campus official newsletter (On- campus 13 May 2004) the installation of 1000 donated computers. This supply of computers is important for UWC if the institution is to achieve its goals as cited in the Integrated Information Strategy. Therefore, the major challenge now would be to make sure that there is adequate support and skills training for students to optimally use these computers, and reassess the institutional conditions of access with regards to adequacy.



In conclusion, this study has shown that there is a huge need for the institution to provide adequate computer resources for students. It has further illustrated that physical provision would not be enough. Moreover, I suggest that the manner in which students use these computers needs to be monitored and that a curfew should be imposed. The study has also raised some major questions, which the institution should be grappling with; among these would be to assess the processes that are in place towards achieving better access to meet the needs of the students, also looking at making sure that students are effectively using computers, when they have access.


REFERENCES

- Adam L. (2001) Information and Communication Technologies and Higher Education Reform in Africa: Progress and Trends. *Journal of Higher Education in Africa*.
- Adam, L. (2003) Information and Communication Technologies and Higher Education in Africa: Initiatives and Challenges. *Journal of Higher Education in Africa*, 1(1): 195- 221.
- Alan, C. (2001). Closing the digital divide. *Adult learning*, 12 (9): 6-13.
- Anon. Undated. *Mission and Vision*, University of the Western Cape. Available online <http://www.uwc.ac.za/about/indexr.html>
- Atan, H., Sulaiman, F., Rahman, Z.A. & Idrus, R. M. (2002). Gender differences in availability, Internet access and rate of Usage of computers among distance learners. *Education Media International*, 39 (3 & 4): 205 – 210.
- Babbie, E. & Mouton, J. (2001). *The practice of social research*. Cape Town. Oxford University Press.

Beebe, M.A., Kouakou, K.B., Oyelaran-Oyeyinka, B. and Rao (eds) Africa dot edu:
IT opportunities and higher education in Africa. New Delhi: Tata McGraw-Hill

Breen, R., Lindsay, R., Jenkins, A & Smith, P (2001) The role of Information and
Communication Technologies in a University Learning Environment. *Studies in
higher Education*, 26(1): 95 – 113.

Burkle M. (2001). *Virtual Learning in higher education in Mexico and South Africa:
Prospects and Possibilities*. Seminar delivered at the Monterey Institute of
Technologies, ITESM, Mexico.

Burbules, N. C. & Callister, Jr. T.A. (2000).  *Watch IT: The risks and promises of
Information Technologies for Education*. Colorado. Westview press

Carey, J. Chisholm, I.M. and Irwin L.H. (2002). The impact of Access on
perceptions and Attitudes Towards Computers. An International study.
Education Media International: Special issue in ICT and Media, 39(3&4): 223 -
235

Corbett, B. A. & Willms, J.D. (2002) Information and Communication Technology:
Access and Use. *Education Quarterly Review*, 8 (4) 8 –15.

Czerniewicz L. (2001). Reflections on Learning Online – the hype and the reality,
South African Journal Higher Education 15 (3)

Czerniewicz, L. and Brown, C. (2004). Access to ICTs for teaching and learning –
from single artifact to inter-related resources. University of Cape Town,
Unpublished paper.

Czerniewicz L. and Ng'ambi D. (2004) Students' use of computer in UCT's 'walk-
in' laboratories. *British Journal of Educational Technology*, 35(2) 241-246.

Dorr, A. & Besser, H. (2002). *Re-evaluating the Brigade! An expanded framework for
crossing the digital divide through Connectivity, Capability, and Content*. A
report on the digital divide's multiple dimensions: indicators for measuring
success. A public policy roundtable of the pacific Bell/UCLA Initiative for 21st
century literacies. UCLA graduate school of education & Information studies,
August 1-2 & 4-5.

Department of Education. (2003) Draft White Paper on e-Education. Transforming
Learning and Teaching through Information and Communication Technologies.
Pretoria. Government Gazette. [http://www.gov.za/whitepaper/2003/e-
education.pdf](http://www.gov.za/whitepaper/2003/e-education.pdf).

Department of Education. (1997). *Education White Paper 3 - A programme for the transformation of higher education*. Pretoria. Government Gazette.

<http://www.gov.za/whitepaper/2003/e-education.pdf>

Department of Trade and Industry. (2002). *Progress towards ICT integration in South Africa: Survey of SA Government-led initiatives*. Prepared by bridges.org, June 2002.

Finke L. (2002). *Women: Lost in cyberspace? The culture of virtual communities*.

<http://www.enhanced-learning.org/prox/paper5.html>.

Gorad, S., Selwyn, N. and Furlong, J. (2003). How do adults use ICTs for learning? *Adults learning* 15(3): 18 –20.



Gurstein M. (2003) Effective use: A community informatics strategy beyond the Digital divide. *First Monday*, 8 (12) December 2003.

<http://www.firstmonday.org/issues/issue8/Gurstein/index/html>.

Hall M. (2001). *New media: Prospects and Concerns for higher education teaching and learning*. Centre for Higher Education Development, UCT, Cape Town.

Jappie, R. and Daniels, A. (2004). 1000 PCs for Campus. *On-campus. An official campus newsletter for the University of the Western Cape*. 13 May 2004.

Keats, D. (2002). *Integrated Information Strategy for the University of the Western Cape*. Version 1.3. <http://www.uwc.ac.za/ics>

Koubek, A. & Jandl, M. (2000). Diversified use of ICT in education. *Campus-wide Information Systems*, 17(5): 161 – 166.

Lundall P. & Howell, C. (2000). *Computers in schools: a national survey of Information and communication technology in South African Schools*. Education Policy Unit. University of the Western Cape.



Mashile, E.O. & Pretorius, F.J. (2003). Challenges of on-line education in a Developing country. *South African Journal of Higher Education*, 17(1) 132 – 139

Midzi, W. (2003). Women's participation and access to ICT- challenges for Southern Africa. *A gender and development newsletter for Southern Africa*, issue 28 Jan-March 2003.

Miller, A. (2001). *Reaching across the Divide: The challenges of Using the Internet to Bridge Disparities in Access to Information.*

http://www.firstmonday.org/issues/issue6_10/miller

Omar, E. (2003). *Educators' access, training and use of computer-based technologat Selected primary schools in the Cape Town suburb of Athlone, Western Cape.*
Unpublished Master's Mini-thesis. Western Cape: University of the Western Cape.

Rajagopal I & Bojin N. (2003). A gendered world: students and instructional technologies. *A Peer-reviewed journal on the Internet.*

<http://www.firstmonday.org>



Reynolds D; Treharne D. & Tripp H. (2003). ICT – the hopes and the reality. *British Journal of Educational Technology.* 34 (2) 151 – 167.

Robins M.B. Are African women online just ICT consumers? *The International Journal for Communication Studies.* 64 (3) 235 – 249.

Ryder, M. (2003). *The Digital Divide.*

<http://www.carbon.curdenver.edu/~mryder/dd.html>

Sanyal B.C. (2001). *New functions of Higher Education and ICT achieve education for all*”, International Institute for Educational planning, UNESCO, a paper prepared for the expert roundtable on University and Technology for literacy/basic educational partnership in developing countries, Paris, September 2001.

Sayed, Y. (1998). *The segregated Information Highway*. Juta/University of Cape Town press. South Africa.

Selwyn, N., Marriott, N & Marriott P. (1998). Research Notes: Home computers & University ICT use. *Journal of Computer Assisted Learning* (2002). 18: 44-45.



Snyder I., Angus L., & Sutherland-Smith W. (2002) “Building Equitable Literate Futures: home and school computer-mediated literacy practices and disadvantage”. *Cambridge Journal of Education*, 32 (3): 367- 383

Smith, G.G., Ferguson, D. & Carris M. (2001) Teaching college courses online vs. face-to-face. *Technological Horizons in Education*, 28(9).

Sullivan P. (2002) “Its easier to be yourself when you are invisible”: Female college Students discuss their online classroom experiences. *Innovative Higher Education*, 27(2) 129-144.

Taylor P.G. (2000). *Changing expectations: Preparing students for flexible learning*.

Griffith Institute for Higher Education, Griffith University, Australia.

Warschauer, M. (2003). *Technology and Social Inclusion: Rethinking the Digital*

Divide. Massachusetts Institute of Technology.

Wheeler S. (2000). *The role of the Teacher in the use of ICT*. Keynote address

delivered to the Czech Teachers Conference. University of Western Bohemia,

Czech Republic, May 2000.



APPENDIX A: Letter to students

25 August 2003

Dear student

I am Masters student in Higher Education Studies: Policy Analysis, Leadership and Management programme with the Education Faculty. I am also working as a research intern with Center for Study of Higher Education (formerly EPU).

In this regard, I request that you assist my studies by completing this questionnaire investigating issues of Distribution, Access and Use of computers by students at UWC.



All information gathered will be treated as confidential.

Thanking you in advance

Yours sincerely

.....

Sibusiso Mkhize

APPENDIX B: Excerpt on “Vision and mission” of UWC

The University of the Western Cape is a national university, alert to its African and international context as it strives to be a place of quality, a place to grow. It is committed to excellence in teaching, learning and research, to nurturing the cultural diversity of South Africa, and to responding in critical and creative ways to the needs of a society in transition. Drawing on its proud experience in the liberation struggle, the university is aware of a distinctive academic role in helping build an equitable and dynamic society.

In particular, it aims to:

- Advance and protect the independence of the academic enterprise;
- Design curricula and research programmes appropriate to its southern African context;
- **Further global perspectives among its staff and students, thereby strengthening intellectual life and contributing to South Africa’s reintegration in the world community;**
- **Assist educationally disadvantaged students gain access to higher education and succeed in their studies;**
- Nurture and use the abilities of all in the university community;
- Develop effective structures and conventions of governance, which are democratic, transparent and accountable;
- Seek racial and gender equality and contribute to helping the historically marginalized participate fully in the life of the nation;
- Encourage and provide opportunities for lifelong learning through programmes and courses;
- Help conserve and explore the environmental and cultural resources of the southern African region, and to encourage a wide awareness of them in the community;
- Cooperate fully with other stakeholders to develop an excellent and, therefore, transformed higher education system.

Source: <http://www.uwc.ac.za/about/indexr.html>

APPENDIX C: Student questionnaire

Biographical Section

Please circle the number that is most applicable to you in respect of each of the following items. Your response will be treated as confidential.

A. Your age

- Under 20 years 20 –23 years 24 – 28 years
29 – 35years 35years and above

B. Gender

1. Male 2. Female

C. Race

1. African 2. Indian 3. Coloured 4. White

D. Current studies

	Full time	Part time
Bachelor's Degree		
Honour's Degree		
Master's Degree		
Doctorate		
Post graduate Diploma		
Undergraduate certificate		

E. If undergraduate, which year?

- a) 1st b) 2nd c) 3rd d) 4th

F. Faculty where enrolled

1. Arts 2. Education 3. Economic & Management Sciences
4. Natural Sciences 5. Dentistry 6. Community & Health Sciences
7. Law

G. Where do you currently stay?

1. Home 2. Private Lodging
3. University residences 4. Other

H. Are you currently employed?

- 1. Yes
- 2. No

Now please answer the following questions pertaining to computers.

(Please circle all those appropriate for you)

1. Where do you use a computer?

- a) Current address
- b) On campus
- c) at work
- d) other

1.1 In the case of other please specify:.....

1.2 In the case of On campus :

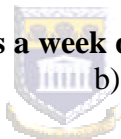
- a) Thintana
- b) Education
- c) Science
- d) Writing Centre
- e) EMS
- f) Library
- g) Law resources centre
- h) In my department

1.3 Do you get enough assistance whenever you encounter problems?

- a) Always
- b) Never
- c) Sometimes

2. Approximately how many hours a week do you use a computer?

- a) Less than 10 hours
- b) 10 - 20 hours
- c) 20 hrs or more



If you answered A, can you say why?

.....

3. Which of the following activities do you normally use a computer for? (Please tick appropriate, you can tick more than one)

I use computers for Reading	Surfing	
	Finding information	
I use computers for Communicating	SMS	
	E-mail	
	Discussion forum	
	Chat rooms	
I use computers for Producing	Writing	
	Programming	
	Drawing	
	Designing	

	Publishing online	
--	-------------------	--

4. Which of the following search engines do you use to conduct information searches? (Please tick appropriate)

1. ANANZI	
2. GOOGLE	
3. YAHOO	
4. ASK.COM	
5. OTHER (specify)	

5. Which of the following database do you normally use?

1.EBCOHOST	
2. EMERALD	
3. NEXUS	
4. INFOTRAC	
5. OTHER (Specify)	
6. NONE	

6. What do you use search engines for? (Please tick where appropriate)

1. ACADEMIC	
2. ENTERTAINMENT	
3. GENERAL	

7. What can be done to improve students' usage of computers?

.....

8. For how long do you normally need to use a computer for academic purposes?

- a) Hour b) 3 hours c) 6 hours d) twice a week e) Other

9. Do you feel that you have enough time to use a computer for academic purposes?

- a) Yes b) No c) Not sure

10. What are the main problems you experience when you using a computer?

.....

11. Do you use Internet for academic purposes?

- a) Yes b) No c) Sometimes

12. Are there enough computers to use?

- a) Yes b) No c) Don't know

13. What can be done to improve access to computers for students?

.....
.....

14. When do you normally use a computer?

- a) Morning b) Lunch c) Afternoon d) At night

15. Have you had formal computer training?

- a) Yes b) No

If yes specify where and when?



16. When would you prefer computer labs to be closed?

- a) At night b) Weekends c) Holidays d) All three e) Never

17. For how long should computer labs stay open?

- a) 12 hours b) 18 hours c) 24 hours

APPENDIX D: Interview schedule for Senior Management

- What kind of work are you doing and for how long have you been doing this it?
- What kinds of resources are available for students?
- Are there enough computer labs for students on campus?
- Who decides where computers are and who get access to them?
- Who decides on the operating times for the computer labs? (Opening and closing times)
- In your opinion, what are students using computers for?
- In your opinion, what are factors that contribute or obstruct the distribution of resources besides finances?
- Is the institution assisting students to get the ir own computers?
- What policy changes have brought about in as far as the availability of computers are concerned?
- What has been your success story so far in your portfolio in terms of computer access and usage?

- Where does the institution see itself in 5 years time with regards to computer provision?

APPENDIX E: Interview schedule for lab managers

- What kind of work are you doing in the lab and for how long have you been do it?
- What are you opening and closing times for the lab?
- Is the lab open or close over the weekends and holidays?
- What kind of assistance is available for students in the lab?
- What kind of problems do students normally come to you with?
- What do students normally use a computer for?
- Do you have computer literacy classes? If yes, for whom?
- Which students are using this computer lab?
- In your opinion, are there enough computer labs on campus for students?
- Do you think that UWC is on the right track in terms of computer provision for students?

