Chapter 1 – Introduction

1.1 Objective

This study sets out to discover the role that Information and Communication Technology (ICT) can play in a higher education institution with specific reference to disadvantaged students, cultural aspects and motivation.

1.2 Introduction

At University of Limpopo (UL), a typical student has not worked with a computer before coming to the university. In this study, I refer to such a student as disadvantaged or under-privileged student. It should be noted that UL belongs to the category of universities in South Africa that are referred to as Historically Disadvantaged Institutions (HDIs).

As the head of ICT, I introduce the available ICT facilities at the University to the new students during the orientation program each year.   A question that I often ask during my presentation is how many of the new students have had any exposure to a PC, the Internet or email. In a group of roughly one thousand students, less than a handful respond positively.   During the last 19 years of my involvement in ICT management in two South African universities, I have been witnessed to the tremendous transformation that takes place as such students visit our computer laboratories and start using them. Often in a short span of time, ICT tools such as the Internet, email and Office products become an indispensable part of student learning life. This happens without necessarily any direct intervention from the ICT division to introduce any formal courses.   All that is required is to have the infrastructure available for student access.   Provided such resources remain available, they become the most useful and dependable resource for the students' academic life.   Indeed, such a phenomenon is not without parallel.   The idea of self-directed learning has been extensively

discussed in the last two decades. A similar experience was reported initially in India and later replicated globally, albeit in relation to a younger group of learners. Professor S. Mitra, following a series of studies in India (Mitra, 2000, 2003, 2005) commonly referred to as "Hole-in-the-Wall" or "Minimally Invasive Learning" projects, highlighted the possibility of children learning various topics such as computer literacy using computers with little or no supervision. The research generated interest elsewhere with similar conclusions. Mitra and Rana (2001), Inamdar (2004), Van Cppelle (2004), Dangwal, Jha, Kapur (2006), Cronje and Burger (2006), Gush, Cambridge and Smith (2004) are but a few examples. In the words of Mitra and Rana (2001, p.11) "underprivileged children without any planned instructional intervention, achieved a certain level of computer literacy". Subsequently, there have been many similar studies to verify the universality of these initial findings. Dangwal, Jha and Kapur (2006, p. 295) feel that this category of learning falls into the ambit of a "special case of the interplay of information technology (computers) and learning processes and emphasises the role of self-directed and participatory learning."

In this phenomenon as described above, a group of children with the common denominators of cultural and underprivileged backgrounds are exposed to technology, and, as the result, there appears to be a level of self-directed learning that takes place. A number of questions came to mind. To what extent are these principles applicable to students of an older range group, i.e., university students? Where does this interest in technology come from, and what motivates these students to be attracted the technology? Do their newly discovered media make a difference in their academic achievement?

The scenario depicted above illustrates the general theme of this research and the sort of questions that it sought to answer. It is true that large scale quantitative studies indicate that ICT produces a statistically significant difference in learning outcomes on standardized tests of literacy, numeracy and science (Wenglinsky 1999; Weaver 2000, Blackmore, Hardcastle, Bamblett, and Owens

2003). However, little attention has been made in literature to disadvantaged students.

In summary, therefore, this study looks at UL with its particular historical background and attempts to discover the possible roles that ICT can play to accelerate learning.   The next section of this chapter reports on the rationale for this study from practical and academic perspectives.

1.3   Rationale

The rationale for this study is reported at two levels: practical and academic. The practical rationale deals with my personal experiences that encouraged me to follow this path. The academic rationale highlights the preliminary justification for the study as I consulted the literature.

1.3.1 Practical rationale

Since my graduation in B.Sc. Computer Science in 1980, I have been involved in various forms of ICT support functions in my various occupations: application development, systems analysis and design.   More significantly, in the last 19 years as a senior manager, I have been responsible for providing ICT tools and facilities in two academic institutions of higher learning in South Africa.   There is a common agreement that providing operational services such as the running of administration systems, the Internet, email and the network infrastructure in a university environment is an indispensable function that must be fulfilled.   During the past few years, ICT in UL has attempted to provide some level of academic support by facilitating various e-learning computer literacy courses together with designing online courses for interested lecturers. It is in the area of teaching and learning that the real challenges seem to be emerging.   As ICTs becomes more widely used in classrooms and schools, attention is being focused on how ICTs

can make teaching and learning more effective (Blackmore, Hardcastle, Bamblett and Owens 2003, p. 11). This led to a decision to conduct a formal research and explore the ways that a student, and in particular a previously disadvantaged student, like those in UL, can more effectively benefit from ICT tools. Similar conclusions on the need for "institutional research" to unravel ICT potential have been expressed elsewhere. "Institutional research should focus on determining the value that ICT can add to teaching and learning activities, the specific barriers and incentives that will work within the institution, the most effective paths for individual learners and a greater focus on the monitoring and measuring of costs" (Twigg, 2001, p. 30, Van der Merwe, 2004, p. 339).

If I were to summaries my observations in terms of students' response to ICT use it would include the following:

- There is a keen interest to use ICT facilities by a high percentage of the students.
- ICT tools, such as the Internet, email and Microsoft Office products have become critical and indispensable in the learning life of a student.
- More access to ICT tools means improved access to educational material.
- Accessible ICT facilities imply improvement in the quality of learning.
- A high level of collaborative learning takes place amongst the students in showing each other newly discovered computer features.
- Minimal supervision or intervention is needed to promote computer literacy. Once the correct environment is created, most of the effort comes from the student.

There were many questions I was looking for an answer. Where does the fascination with computers come from? Is it real and lasting or imaginary and transitory? Has this apparent interest and therefore association with ICT tools resulted in any academic excellence?

1.3.2 Academic Rationale

In this section, I relate the academic puzzle of this research to the relevant literature so as to discover if there is justification for such a study.

In this endeavour, I turned to Hartley (2007) who reminded me of the well known research "Hole-in-the-Wall" which, in some ways, has had practical implications for this study. Here, at UL, often a student with no prior experience with technology (a computer) walks to the computer laboratories with a few friends and a few days/weeks later he/she is already addicted to this new way of learning.   This is partially due to the informal communication that takes place amongst students. Following a similar experience for the developing countries, Hartley concludes: "Such a picture of the potential use of new technology in developing countries is perhaps an idyllic one" (Hartley 2007, p. 55). This well-documented and well-known phenomenon brought about many questions. How, and to what extent can such interest or motivation be harnessed and directed for educational purposes? Beneke (1999) feels that empowerment can only occur when it is clear who the learners are that require this empowerment. Each institution should have a clear picture of the profile of their students (Beneke, 1999, p.1). Although here Beneke makes special reference to distance learning, the principle of knowing your students for effective learning is applicable to all types of students. Oblinger, Barone, and Hawkins (2001, p. 43, 32), similarly, identify the "understanding of" one's institutional "culture/context, values and sensitivities", in the context of positive change, as one of the twelve essential conditions for a "venture to succeed". My focus in this study was on the student and the manner in which he/she is influenced by the learning environment. In order to provide an effective service, ICT needs to understand the culture from which students come from, their values and sensitivities to be able to provide technological solutions that will attract the student. Lomas and Oblinger (2006, p.8) extend this concern to include students' learning space, i.e., classrooms, computer laboratories and technologies that a learner is surrounded by.   They

bring to one's attention the importance of knowing students' traits and habits in order to be able to create an environment that is suited to learners' particular background and expectations.   "This alignment is important because well-designed learning spaces and enabling technologies encourage students to spend more time on campus, increasing engagement and improving retention."

The question that comes to mind is what are these unique cultural traits, habits and sensitivities that are associated with a typical disadvantaged setting like those in this study? Niles (1995, p. 381), in his study, recommends finding answers to a number of questions. First, he says, "we need to differentiate clearly between different types of **motivation** in different **cultures** and examine the relationship between them and academic achievement."   He further suggests that we then need to examine the relationship between different types of motivation and achievement. In other words, motivation is affected by culture. We need to understand a culture to be able to arrive at a possible motive.

Therefore, what literature seems to suggest, is that, in order to provide an effective educational environment, we need to understand the culture from which we can determine students' motivation for learning. Once motivations are known, an educational environment can be provided that is motivational. Kirkwood and Price (2005, p.270) takes this idea further and brings in a variable that is of major interest in this study, namely, technology, into the equation.

> "We contend that it is essential for teachers and decision-makers in higher education to develop a better understanding of the issues surrounding the use of ICT, so that innovations are not driven by technology. The new circumstances for learners and learning require consideration to be given not only to the characteristics of technologies, but also to:
>
> (a) the pedagogic models and processes they have to serve; and

(b) the contexts within which learners engage with ICT."

Although Kirkwood and Price are not specifically referring to culture and motive, he is confirming that technological solutions must meet the specific needs of the students.

Bates (1997, p. 3), who comes from the directorate of Distance Education and Technology at the University of British Columbia, completed a comprehensive strategy for implementing technology-based learning shares the same sentiments:

> "(A)lthough there has been widespread adoption of new technologies for teaching in the last few years, they have yet to bring about major changes in the way teaching is organized and delivered. Without such changes, though, technology-based teaching will remain a marginalized activity, while at the same time leading to increased unit costs".

For technological change to be effective, it usually needs to be accompanied by major structural and organizational changes for its full potential to be realized.

However, a change must be informed by relevant information about its intended recipients, in this case the students. Literature seems to suggest that the relevant variables are those associated with students' culture and motivation that, once known, prescribe the technology solutions that must be applied. Study should be conducted into the role that culture plays in learning (Ackerman, 2004, p. 252). Hence students' cultural and motivational orientation together with technological background are explored and documented in chapter 4 of this study. Lazenby (2003, p. 297), in her suggestion for further research, points to the need to investigate whether strategies are used at other higher education institutions in terms of innovation and perhaps find a correlation between the strategies used and the culture of particular universities. She further identifies

that an area that requires considerable research is the "needs of South African learners and lecturers in a flexible learning environment – specifically web-supported learning" (Lazenby, 2003, p. 297).

Based on these recommendations from literature, I have attempted, in this study, to examine the interplay between student culture and motivation on one hand and the influence of these on technology use and academic performance. This, in turn, has enabled me to make a series of recommendations in chapter 5 for an improved and effective learning environment.

In summary, literature seems to suggest a physician like approach where one first must find and understand the needs of the patient (student) before prescribing a remedy(design educational environment). The elements of the diagnosis are motivational and cultural factors that in turn inform the technology options and solutions that must be provided.

1.4   Gaps in the Literature

In this section, having covered the practical and academic rationale for this study, further justification, in terms of need for such research, is documented.

A serious deficiency in the motivation literature is the relatively little attention that has been given to differences related to socio-cultural backgrounds (Maehr,and Meyer 1997, p. 371).   Nelson, O'Mara, McInerney and Dowson (2006, p. 400), while acknowledging that there has been much research on "psychological constructs relating to academic engagement and achievement in a cross-cultured setting", feel that they have "rarely been extended to the developing world." They further point out "the processes by which students from majority, indigenous and under-developed nations are motivated in school are unclear". In this study, the

focus has been on the majority, indigenous and under-developed with the aim of finding psychological constructs that result in academic achievement.

Blackmore, J., Hardcastle, L., Bamblett, E. and Owens, J. (2003, p.iii), as part of an Australian study, concluded that "while ICT offers considerable possibilities, the ways in which ICT improve learning outcomes has not yet been fully investigated, particularly in the case of students who are **disadvantaged**." This is precisely what this study aims to accomplish.

In her recommendation, Van der Merwe (2004, p. 339) suggests further research on "how the use of ICTs can promote diversity in terms of teaching and learning styles." This study aimed at finding students' special cultural and motivational orientation so that befitting ICT solutions in the learning environment can be recommended.

Fresen (2005, P. 230), in her study and recommendation for further research, asks "what steps can be taken to reduce levels of student frustration and increase levels of student satisfaction", a question that this study aims to discover.

As can been seen from above illustrations, literature provides a wide range of expressions in support of research to be conducted in disadvantaged settings to find an appropriate role for ICTs by examining students' motivational and cultural orientation.

1.5 Theoretical Framework

In this section a number of theoretical frameworks that this study aims to examine are documented.

Figure 1.1 – Depicts the Theoretical Frameworks for this study showing the influence of culture, motivation and technology on the learning environment.
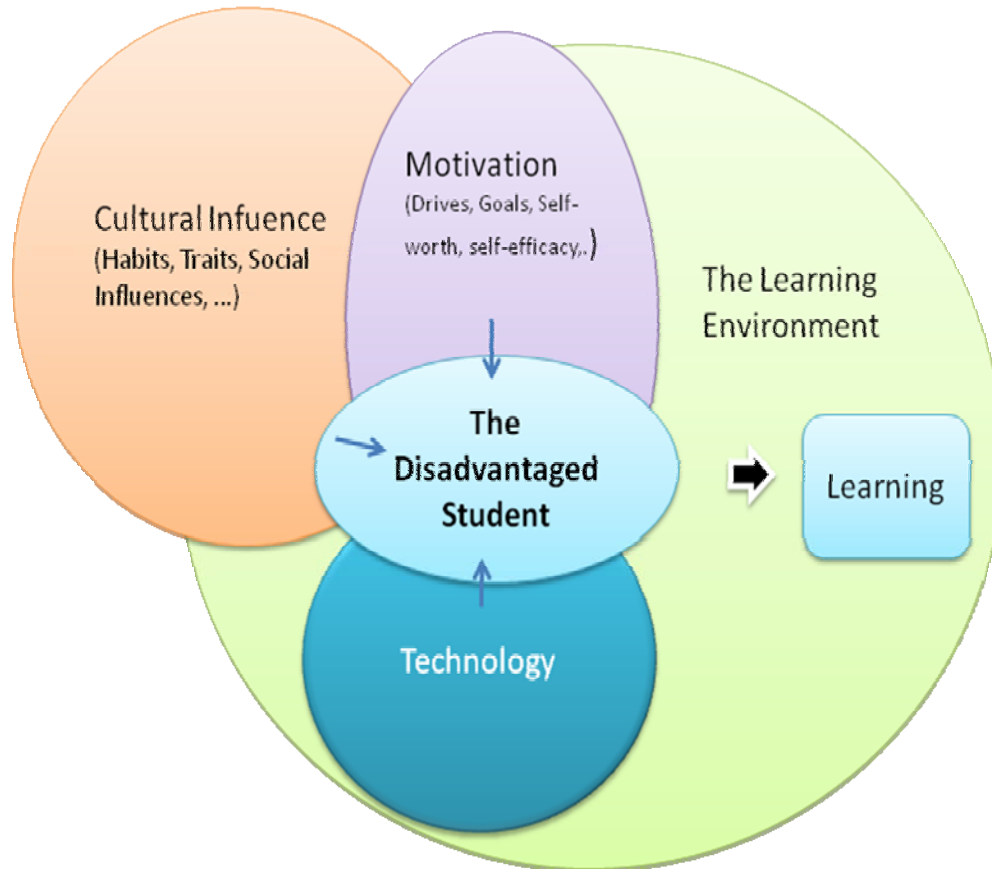

Figure 1.1 I illustrates the underlying theoretical frameworks that govern this study.   At the centre of the educational environment is the disadvantaged student that is affected by a series of influences.

First of these influences come from students' **cultural** background. Much of research conducted in recent decades believes that learning is influenced by a student's culture and personality (McClelland, Atkinson, Clark and Lowell,1976, p. 288; Anderman and Anderman, 1999; Nelson, O'Mara, McInerney and Dowson, 2006; Ramburuth and McCromick, 2001; Niles, 1995; Kennedy, 2002).

Bandura, Bakbaranelli, Capraba and Pastorelli (1996, p. 1206) as an example found that parents' sense of academic efficacy and aspirations for their children were linked to their children's scholastic achievement through their perceived academic capabilities and aspirations. Similar findings have been reported elsewhere (McClelland, Atkinson, Clark and Lowell, 1976; Covington, 1998, pp. 47–48; Bandura, 1997; Weaver, 2000). All such assertions are tested to find if there is a cultural influence in terms of students' technology use or academic performance. In other words I look to find answers to the following questions.

Does culture influence motivation and academic performance?

Do family and friends play a role in motivating ICT use and thereby influence academic results?

If so what is the implication for ICT service delivery in an educational environment?

The second area whose influence on the educational environment is examined is the role of **motivation.**

Professors S. Mitra's (Mitra and Rana 2001, p.11) asserted that "underprivileged children without any planned instructional intervention achieved a certain level of computer literacy". This theory, while tested repeatedly against young children in various parts of the world will, in this study, be tested against UL students who are older than those of previous experiments. The second variable in Professor Mitra's statement, the underprivileged student, will remain the common denominator in both class of studies.

In this study, I examine the relationship between culture as having a dominating influence on an individual's character and motivational drive towards learning. In this aspect of the study several theories are tested:

- McClelland assertion that links culture and performance (i.e., motivational achievement)

- Mitra's assertion that the use of technology can accelerate learning in a disadvantaged setting.

1.6 ICT Status at The University of Limpopo (UL)

UL came into being as the result of a merger between the University of the North (UNIN) and the Medical University of South Africa (MEDUNSA) in January 2005. The two campuses are approximately 300 kilometres apart. This study primarily focuses on the activities of what used to be the University of the North, which is now referred to as the Turfloop campus of the University of Limpopo, with 75% of the total student population of the new institution.

The Turfloop campus has seen a major transformation in terms of student computer access during the last few years. In 1997, despite global awareness of ICT importance in learning and education, 95% of our students graduated without ever touching a computer keyboard. This trend started to change in 1998, when ICT had the first set of general-purpose computer laboratories (Labs) with a total of 100 Personal Computers. The new computer labs were available to the general student population. In 1999, a donation of additional PCs improved the situation. In 2009 there are over 600 Personal Computers that are available for general student use. These are being managed by ICT. There are another 400 Personal Computers in specialized computer labs that are managed by other departments such as Computer Science, Statistics, and Mathematics that are not detailed in this report.

The general-purpose computer laboratories are now opened from 07h30 until 24h00 during weekdays and slightly shorter hours during weekends. There is a

keen student interest to use the facilities. The evolution of computer literacy has been steady and continuous. UL students have embraced the new technology and feel very comfortable to use it. Indeed, to witness and be part of such a transformation has been most heart-warming. Ready access to information through the Internet has become an indispensable tool for every student. Every registered student automatically gets a GroupWise email account as soon as he/she is registers. Every Personal Computer in the Computer Laboratories is connected to the Internet. The available bandwidth is 14 Mbps, half of which is used by students at any given time. There are various online courses that are available to students. In Turfloop, in 2008, close to 3000 students registered with courses with online content. Some of these have been developed by the lectures as part of an e-learning initiative. These are designed for specific disciplines while others are of general nature, such as computer literacy courses.

UL uses WebCT (now Blackboard) as its Management Learning System. It was initiated by one academic department with interest in e-learning and gradually became more accepted by the rest of the community. It is, however, driven by ICT rather than holistically by the academic community. Today there are a dozen lecturers that are using the tool on a voluntary basis.

There is a computer literacy program that is run covering Office products. The material is available online with access given to every interested student.   During the last three years, an average of 1000 students registered each year for computer literacy, took its test and obtained a certificate.

1.7   Report Outline

In chapter 1, I described the objective, aims and the rationale for the study. Further, evidence from literature was used to demonstrate the need and academic justification for this research. This was followed by a brief expression of the literature gap that exists in this line of research, which provided further

justification for it is being conducted. This led to the theoretical framework that governs this study followed by the research questions.

The remaining chapters for this study are as follows.

Chapter 2, the literature survey, documents findings based on literature as related to this study, where the academic foundation of the research is situated. The literature review examines three inter-related variables that constitute the main focus areas in this study. These are first, **Culture** where the student comes from and where his/her character, habits and traits are formed. Second, is **motivation** for learning, which, in this study, is assumed to be influenced by the students' culture.   The third variable is the **students' response to technology**. Here, the perceived role of technology is examined to see if it does indeed act as a motivational tool in the learning environment.

Chapter 3, the research design and methodology, outlines the plan that is adopted to unravel the mystery that I attempt to solve. Areas such as the philosophical framework, research strategies, data sources, and the tools used i.e., the questionnaire, are covered in this section.

In chapter 4, I describe and analyse the responses to the questionnaire and document the findings. It consists of four major sections. Section 4.1 focuses on students' extent of ICTs use and dependency. Section 4.2 explores the ICTs usage in relation to academic performance.   Section 4.3 and 4.4 discuss the findings from students' cultural and motivational perspectives.

In chapter 5, the major findings of this study are summarised before the conclusions and recommendations for this study are documented.

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