LEARNING AND DOING: EXPLORING THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN FOSTERING LEARNING AND EDUCATION AMONGST YOUTH IN RURAL KWAZULU-NATAL

by

INGER MAY HARBER

205511303

Submitted as the dissertation component (which counts for 50% of the degree) in partial fulfilment of the requirements for the degree of Master of Development Studies in the School of Development Studies, University of KwaZulu-Natal, Durban.

September 2014

As the candidate's supervisor I have approved this short dissertation for submission.

Date: 05 September 2014

Name: Dr Michael Rogan

Signed: 

The financial assistance of the National Research Foundation (NRF) towards this research is hereby acknowledged. Opinions expresses and conclusions arrived at, are those of the author and are not necessarily to be attributed to the NRF.

ABSTRACT

Information and Communication Technology (ICT) offers an abundance of opportunities for innovation and development in the ways that information is stored, transmitted and received. As such, ICT has the potential to act as the catalyst to fundamentally shift our pedagogic paradigm. As ICT adopts an increasingly pivotal role in society, questions of usage, accessibility and need of ICT become pertinent.

The spread of ICT globally has not been even. This phenomenon is often referred to as the 'digital divide' and differentiates between those who do, and those who do not have access to or make use of ICT. The work of Roxana Barrantes and Mark Warschauer, among others, urges us to consider the divide as more than just the binary division between the physical presence and absence of ICT. They argue that accessibility of ICT is a matter of a number of intertwining and complex socio-economic factors, including supply, demand and capability.

When one considers these factors in the South African context, one cannot deny that there are a multitude of barriers disenabling access to, and use of, ICT. Such barriers include illiteracy, cultural values, poor service delivery (especially electricity), the high cost of accessing ICT, widespread inequality and poverty, and a wider schism between national legislation and on-the-ground-delivery.

The Community-based Learning ICT and Quality of life (CLIQ) project was established with the aim of identifying whether after a needs-based training program, access to ICT could improve the well-being of the participants. Drawing on data from the project, as well as data collected in independent research, this dissertation focuses specifically on the experience of youth living in eSicabazini, a rural community in KwaZulu-Natal. The experiences of the youth are utilised in the exploration of the role of ICT in fostering learning and education amongst youth in a rural community. The findings suggest that the ability to store, transmit and receive information is vital in today's society. They also find that increasingly, the formal education system has been unable to meet the needs of the people living in South Africa. As such, alternative systems for knowledge building and skills development are necessary, and ICT offers a potential catalyst for such

alternatives to thrive; such alternatives could support existing structures or run in parallel. In order to access and use ICT, however, a number of factors need to be in place. While this dissertation highlights some of the ways in which ICT could foster education and learning, such results are often impeded by external or peripheral circumstances or influences beyond the control of those affected.

Word Count: 423

PREFACE

The research described in this dissertation was carried out in the School of Development Studies, University of KwaZulu-Natal, Howard College Campus, Durban, from May 2010 to November 2010, under the supervision of CLIQ Project Manager, Heidi Attwood, and CLIQ Principal Investigator, Professor Julian May. This includes the field research which was conducted in October 2010 in eSicabazini, KwaZulu-Natal. This dissertation was completed under the supervision of Dr. Mike Rogan.

The following dissertation, unless specifically indicated to the contrary in the text, is the candidate's own work, and has not been submitted, in part or whole, to any other tertiary institution. Where use has been made of the work of others, it is duly acknowledged in the text.

Signature: 

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ACKNOWLEDGEMENTS

Thirteen coursework courses, fourteen countries, four homes, three job titles, endless streams of essays and notes, countless litres of tea, and one broken heart, have all contributed towards getting me to this point.

I would like to thank my parents, Roz and Rodney Harber, for supporting me throughout this process, and for showing me that education extends well beyond classrooms. I would also like to thank my sisters, Alison and Emma Harber, for teaching me that the human mind has many ways of working, and for their love and support. As always, I extend my thanks to my wonderful and inspiring friends.

I would like to thank the School of Development Studies at the University of KwaZulu-Natal including staff and my fellow classmates. I would like to thank those who taught me, and learnt with me over the duration of my coursework – especially the late-night gang in the study carrels. This dissertation would not have been possible without the generous funding provided by the National Research Foundation of South Africa.

My thanks to the CLIQ team with whom I worked namely Heidi Attwood, Julian May, Einar Braathen, Phindile Xulu, Jessie Knott, Kathleen Diga and Germaine Kitchen, and to the CLIQ project participants. I would especially like to thank those who were part of my independent research. Thanks also to Professor Julian May for his initial supervision of this dissertation and for moulding and expanding my conceptualisation of poverty in South Africa.

Finally, very special thanks to my supervisor Dr. Mike Rogan without whom, this dissertation would never have become a reality. Mike, thank you for pushing me across the finish line.

In conclusion:

who are you, little i

(five or six years old)

peering from some high

window; at the gold

of November sunset

(and feeling: that if day

has to become night

this is a beautiful way)

e.e. cummings

“New technology is common, new thinking is rare”.

- Sir Peter Blake

1. INTRODUCTION

Human beings are in a constant state of evolution and change, much of which is caused by and results in, technological developments. From electricity, to printing presses to Apple Macs, developments in technology are constantly changing how information is stored and shared. The recent advances in technology have taken us to levels of knowledge, understanding and actions that were inconceivable just years ago. Not only is technology advancing, it is also spreading; with ideas, developments, systems and machines becoming increasingly available and accessible as the systems and machines for communicating these developments advance. Information and communication technology (ICT) can be defined in a number of ways and includes radios, televisions, computers, landlines, mobile phones and internet access. The Organisation for Economic Co-operation and Development (OECD) defines the ICT sector "as a combination of manufacturing and services industries that capture, transmit and display data and information electronically" (1998 in Kelles-Viitanen, 2003:82).

The availability of ICT is not equal globally. Even within countries, the accessibility of ICT resources is uneven. Factors contributing to this unavailability and/or inaccessibility can be of an economic, social, political and cultural nature. In the literature pertaining to ICT, a common term used to refer to unequal access to technology is that of the 'digital divide'. There is a belief that the gap between information 'haves' and 'have nots' not only exists but that it is widening.

If we move beyond the binary concept of the simple presence or absence of ICT, to the reasons for inaccessibility or non-use, we find concepts such as that of "Digital Poverty" (Barrantes 2005, 2007). Such concepts recognise that there are a number of factors that enable (or disenable) a person's access to, and use of ICT. Drawing on the definition of the OECD and the definitions above, we see that ICT consists of instruments that are used to store and display information. We also see that the inability to access these resources (either because they are not available, not affordable, are not

viable or cannot be operated) can lead to an individual being excluded from the modern, information-driven society.

Mark Warschauer (2002, 2004) proposes that we consider the role of ICT in facilitating social inclusion in a framework based on the interaction of ICT and the theory of social inclusion. Adopting this framework, as I do throughout this dissertation, we come to see that digital poverty is complex and multidimensional, and that it not only consists of discrete factors, but also of a "web of interactions" between these various factors[1].

In adopting this framework, the aim of this dissertation was to explore the role of Information and Communication Technology (ICT) in fostering learning and education amongst youth in rural KwaZulu-Natal.

1.1 Background and Motivation for this study

South Africa is a country defined by huge inequality with pockets of extreme wealth, and debilitating, chronic poverty (Aliber, 2003; Terrblanche, 2002; Verway, 2011). This poverty is characterised by a lack of access to resources for many South Africans that is rooted in complex, systemic issues. South Africa is a country with exemplary legislature, but this is undermined by inadequate implementation. If we agree with the description of poverty as the result of "a complex web of interactions rather than a set of discrete factors" as offered by Hulme and Shepherd (2003:403), we conclude that poverty is in fact multidimensional and dynamic and as such, the interventions proposed to address poverty will also need to be multidimensional and dynamic. One key aspect of poverty reduction is fostering learning and education. ICT is already being utilised in such interventions globally and in South Africa[2].

[1] Hulme and Shephard (2003:403) refer to economic poverty as being the result of "a complex web of interactions rather than a set of discrete factors". Such analysis recognises that it is not just the multitude of factors but also the manner in which they interact that determines the outcome.

[2] Chijioke J. Evoh (2009) offers a mapping of the potential of ICT in teaching which includes using ICT to gather resources and improve knowledge, using online databases and electronic sources to create and track lessons and store results, as well as to communicate with other teachers and learners. Shafika Isaacs (2007) offers an overview of the utilisation of ICT in education in South Africa at the time, in her piece "ICT in Education in South Africa".

As a tool for information gathering and dissemination, ICT could have a pivotal role in poverty reduction, development, and fostering learning and education. Such education may not fall within the traditional definition of 'education'[3]. By expanding our definition to include different systems for learning, we move beyond the physical limitations of the classroom and the time limitations of school years, towards lifelong learning through knowledge acquisition and skills development. It is this expanded framework to which I refer to when I speak of learning and education. This framework proposes that education be viewed as existing within a system that is both affected by, and affects, the context around it. Adopting this framework is key because in South Africa, the formal education system is tasked with simultaneously working to address the long-term effects of the Apartheid system, and enduring the current context of poverty and inequality, all while developing the minds of the young South Africans who constitute the future of the country. As a result of this, the system is strained, and successful alternatives could ease the pressure on the formal education system while also providing for those who 'slipped through the cracks' and need support outside of formal institutions.

A major issue in the South African education system is the inadequate access to resources. Educational practitioners and scholars alike argue that the acquisition of knowledge, skills and conceptual understanding can be severely retarded in circumstances where there is a lack of resources (Nelson Mandela Foundation, 2005). An example of these limited resources can be seen in the staggering number of South African learners, and South Africans generally, who do not have access to ICT. According to the Department of Education, of the 5,653 schools in KwaZulu-Natal, only 12% had access to computers for teaching and learning in 2005 (Paterson, 2007).

[3] "Formal education corresponds to a systematic, organized education model, structured and administered according to a given set of laws and norms, presenting a rather rigid curriculum as regards objectives, content and methodology" (Zaki Dib, 1987:1) and as such, is typically understood to include education that occurs in defined learning spaces, such as classrooms or lecture rooms, and which has a predetermined outcome and output systematically obtained through a curriculum. We need to expand our understanding of education beyond this to include both non-formal and informal education. Non-formal education lacks one or all of the regulatory characteristics of education and constitutes systems such as "distance learning", "correspondence learning" and "open systems" (Zaki Dib, 1987:2-6). According to Zaki Dib (1987:6-7) "informal education" can be defined as activities that add to both formal and non-formal education and can include visits to museums, participation in competitions etc.

Further, the results of a survey conducted in 2005 by Statistics South Africa (StatsSA) indicated that the majority of those living in rural communities have little or no access to ICT infrastructure (Ngobo and Herselman, 2007:713).

In South Africa, illiteracy, cultural values, lack of computer skills, poor services delivery, lack of infrastructure, the high price of internet in rural areas as well as limited access to computers all act as barriers to opportunities to access ICT (Ngcobo and Herselman, 2007:714). The South African government, however, is supportive of ICT investments and this is an important factor in increasing access to ICT. This is evident in national legislation which illustrates that the government believes that a roll-out of ICT infrastructure throughout South Africa, especially in "disadvantaged areas", will help address current socio-economic challenges, by addressing the digital poverty referred to by Barrantes (Farzana Rasool, IT Web, 1 April 2010).

The Universal Service and Access Agency of South Africa (USAASA), the public body tasked with this roll-out, has suggested that in order to increase accessibility, there should be internet access and ICT tools available to all people living in South Africa within a reasonable distance (IT Web, 1 April 2010). The Electronic Communications Act (2005) stipulates that

> For data electronic communications services the targets are a) at least one public broadband internet access point in a geographically founded community of up to 10 000 persons, and if the population of the community is more than 10 000 persons, then at least one public broadband access point for every additional 10 000 persons in that community or part thereof; and b) access to data electronic communications service at a public access point within a range of two kilometres from any person residing in such a geographically founded community".

The 'disadvantaged areas' that have been identified as key areas for the roll out of ICT are usually characterised by low levels of employment, poor service delivery and low levels of infrastructure. The provision of, and access to, basic services such as housing, water, education and health are already very challenging in these contexts. Thus it is difficult to justify the provision and prioritisation of ICT without proving the immediate and long term benefits that such provision would have.

Drawing on Warschauer's (2004) framework, we see that as a transitioning country marred by poverty and inequality, South Africa's approach to development needs to address a complex set of contributing factors in dynamic, efficient manners. At the heart of development and poverty reduction in South Africa, is the formal education system (Cross, Mungadi & Rouhani, 2002 ; Fataar, 1997 ; Kallaway, 2005 ; Ntshoe, 2004). A possible relief of the strain currently on the education system could come from utilising a multitude of alternative systems for knowledge acquisition and skills development. ICT offers some opportunities for expanding and strengthening education (in the broader sense) in South Africa.

As a middle income country, South Africa is theoretically able to provide and facilitate the use of ICT for learning by all South Africans yet the existing historical inequalities in South Africa have meant that ICT is not accessible by all South Africans, especially those living in under-resourced areas (Ngobo and Herselman, 2007). Given that the South African government has decided that such areas should be the starting place for the provision of ICT services, research is needed around which factors foster and which factors hinder learning and ICT use in under-resourced areas. This dissertation will offer some description and analysis of such factors within one such area – eSicabazini, a rural community in the province of KwaZulu-Natal.

eSicabazini is located in ward 8 of the Umhlabuyalingana local municipality. According to the National Census (2001) the population of ward 8 was 2,021 (54.5% female and 45.5% male). More than a third of the population (34.9%) had no schooling and only 11% had obtained a qualification higher than matric. Of the 944 people surveyed regarding income, only 7% were employed while 30% are unemployed and 63% were not economically active. The common living conditions within eSicabazini can be summarised as below:

Table 1: Summary of services and living conditions amongst the 387 households in eSicabazini

	% of households
Live in traditional dwellings	80.4
Use candles for lighting	90.0
"Nearby" access to public telephone	76.2
Use own refuse dump	68.7
Have no means of waste disposal	27.4

Source: 2001 South African National Census (Own calculations)

1.2 Objectives of the Study and Key Research Questions

Discussions about poverty, education and resources are infinite and dynamic, while the scope of this dissertation is limited. Building on existing research and using a sample group of participants of the Community-based Learning, ICT and Quality-of-Life (CLIQ) project in eSicabazini as a case study, the primary objective of this dissertation is to present the results of research that explore the ways in which ICT fostered the learning process amongst youth in KwaZulu-Natal. In order to make considered recommendations about how ICT can foster education, it was important that I identify any barriers to ICT fostering education. As such the preliminary questions that will be explored in my dissertation are:

- Having participated in the CLIQ project, what types of impacts in quality of life did participants identify?
- What, if any, skills and knowledge did participating in the CLIQ project afford the participants?
- What are the barriers preventing ICT from fostering learning and education in rural communities in KwaZulu-Natal?
- What can be done to make the use of ICT in rural communities in KwaZulu-Natal more conjunctive with learning and education?

- What is the role of learning and education in the South African development process? Can ICT foster this? And if so, how?

1.3 Methodology

This dissertation is based on a qualitative research design, and forms one component of the research arising from the "Community-based Learning, ICT and Quality of Life" (CLIQ) project. In the period 2008-2010[4], 113 participants[5] took part in the CLIQ project across four communities in KwaZulu-Natal - namely Adam's Mission, Inanda, eSicabazini and Nhlazuka[6]. The project was part of a collaboration between The Norwegian Institute for Urban and Regional Research and The School of Development Studies (University of KwaZulu-Natal). It was funded by both the National Research Council of Norway and the National Research Foundation (South Africa), with Julian May acting as Principal Investigator and Einar Braathen as Co-principal Investigator.

Following research by The Digital Hub Strategy for KwaZulu-Natal (July 2007), it was decided that a 'one size fits all' approach to ICT development might not be as constructive as training that is tailored to the needs of the participants. As such, CLIQ was based on the belief that in order for people to successfully utilise ICT, they should receive training that they believe they need. It aimed to adopt a tailor-made approach by supporting the acquisition of, and measuring the impact of, skills necessary to operate computers and effectively utilise the internet to access information. As an action-based research project in KwaZulu-Natal, CLIQ was established with the overall goal of establishing whether, after a needs-based training, access to ICT can improve the well-being of people as defined by the people themselves. As such, the objectives of the broader CLIQ project were to:

[4]Note: Report writing and feedback was conducted in 2011. I was part of the project in 2010.
[5] 162 people were selected to take part in the project across the four sites, but only 113 participated sufficiently in order to enable quality of life change analysis, which results in an attrition rate of 30%. In order to enable quality of life change analysis, participants has to attend at least two assessments and/or the final assessment. Unless otherwise indicated, I use the total of 113 participants throughout the dissertation.
[6] These four communities offered a mix of rural, urban and peri-urban environments as well as being "resource-poor communities" (Attwood & Braathen, 2010:5).

1. Facilitate the identification of information and communication needs among selected participants in poorer communities and identify training that can assist in the fulfilment of these needs in order to improve participants' lives.
2. Improve the lives of participants through improving their access to, and use of, ICT in ways that they feel will improve their quality of life.
3. Measure and research the changes to participants' lives, in order to conclude and share the findings and policy implications for the provision of ICT training and access which improves people's lives.
4. Build the capacity of telecentres and their staff through their direct involvement in the project.

Participants were chosen from the communities in the area of study by the team leading the research. The criteria for selection included that the participant must be 18 years or older at the time of selection and have completed high school. Participants could be male or female and upon selection, needed to fall within the classification of "unemployed youth", "self-employed" or "activist[7]". Once selected, participants took part in an introductory training session and then were invited to reflect on their life goals using participatory action research tools. Having identified participants and assessed their needs, well-being and stated life goals, the CLIQ team used this information to design a computer training course. Having completed this course, the participants were given one hundred hours of free computer and internet access. The CLIQ team monitored the use and impact of this ICT access on the well-being of the participant.

While the body of data gathered through the CLIQ project is rich, the focus of the research was assessing the impact of ICT in accordance with the life goals of the participants. While some mentioned furthering their qualifications as part of their life goals, none spoke explicitly about simply wanting to learn more and yet learning was a constant part of the CLIQ process (whether it was learning a new skill or learning about something that was read online). As such, in order to highlight the issues of using ICT to

[7] The CLIQ team note in their research that these definitions later fell away because it was not possible to distinguish between different groups – some people moved between definitions as the study progressed.

foster education and learning, it was necessary to conduct additional fieldwork over and above the use, and reinterpretation, of the existing CLIQ data.

In the construction of this dissertation, primary and secondary data sources were utilised including interviews, email correspondence and a review of both published and unpublished literature. The data analysed in this dissertation came from two sources. The first source is data gathered during the CLIQ project, specifically the Social Views Diagrams of eight CLIQ participants. I refer to publications that make use of the data collected in the CLIQ project in my literature review (Attwood, 2013; Attwood, Braathen, Diga, May, 2013; Attwood, May, Diga, 2011; Attwood, Braathen, 2010; Attwood, 2010) but I also felt it was necessary to re-analyse some of the data presented in this dissertation in order to highlight the perceptions of youth living in eSicabazini regarding the use of ICT. The second source of data is additional research which was conducted with a sub-sample of the CLIQ participants from the eSicabazini study site. A semi-structured interview guide was utilised in order to acquire demographic and socio-economic information from the sample group of project participants as well as information pertaining to ICT knowledge and usage. These semi-structured interviews were conducted with eight individual participants on a one-to-one basis and led to in-depth interviews which examined the way that ICT skills were developed, and consequently, the ways that skills were utilised. In summary, the findings presented in this dissertation are based on an analysis of data collected during the CLIQ project as well as additional data from a semi-structured interview conducted with a sub-sample of CLIQ participants in one rural community.

1.4 Limitations

One key limitation of the study is the size of the sample group which is not representative of the broader population of South Africa or even eSicabazini, but rather offers a ‘snap shot’ of youth utilising ICT. There are two factors that contributed to this limited size sample. One is the decision to focus on participants within the CLIQ project who were classified as “unemployed youth” living in a rural context. As such, the possible sample size of the participants was limited by the project design. The other

contributing factor is that at the time of conducting the research, some of the participants were not in eSicabazini and so they could not participate in my independent research.

1.5 Structure of the Dissertation

The remainder of the dissertation is structured as follows:

Chapter two outlines the relevant theoretical framework and answers the question "What is the digital divide?" Following from this, chapter three reviews the literature which builds the foundation for the consideration of the following questions:

1. How can ICT contribute to poverty alleviation and development?
2. Why is learning and education important? How can ICT be a part of learning and education in South Africa?
3. What has been the provision of ICT (especially in education) in South Africa to date?

Chapter four outlines the study sample and describes the study setting and methodology adopted in both the Community-based Learning, ICT and Quality of Life (CLIQ) project as well as in this dissertation. Chapter five will then present the findings of my research and discuss these in relation to the information presented in the aforementioned chapters. Following that, chapter six concludes the dissertation by reflecting on the findings and makes some research and policy recommendations.

2. LITERATURE REVIEW: THEORETICAL FRAMING

There is a wide body of literature that contributes to the examination of the ability of South Africans to access and utilise ICT in the fostering of education and learning. Given the scope of this dissertation, I have limited this discussion. This chapter considers the theoretical framework of the dissertation before moving on to reflect on the concept of the 'digital divide'. Following this, the third chapter of the dissertation examines the potential role of ICT in poverty alleviation and development. It also examines the role of learning and education in the South African development process and how this intersects with ICT, addressing the foundational question of whether ICT can foster learning and education in South Africa. Finally, in chapter three I briefly survey the history and the current provision of ICT in South Africa through the Universal Service and Access Agency of South Africa (USAASA) as well as other projects providing access to ICT in South Africa.

2.1 Theoretical Frameworks

Conceptual approaches offer a lens through which developmental issues can be analysed, but they can be limited in their scope. This is because development is multifaceted and its components interact and intertwine to form the lived reality of all people. In many discussions, including those regarding ICT and development, a number of conceptual approaches are of relevance and these approaches need to be stitched together to illustrate the complexity of the development process. In completing this research, I was heavily influenced by the concept of a Rights-based approach. According to Hamm (2001), "economic, social, and cultural rights are often classified as second-generation rights, while political rights and civil liberties are considered as rights of the first generation". A Rights-based approach however, argues that development, poverty and human rights are interlinked and subsequently, there is a need to address both as a priority in development.

One useful approach for understanding the context in which the interaction between ICT and development occurs, and a key analytical tool in this dissertation, is a Vulnerability framework. This framework recognises aspects of socio-economic well-being as defined as the risk of exposure to shocks and "the ability of the population to

cope with the consequences of the insecurity" (Downing, 1991 in Moser, 1998:17). There are a number of factors that increase one's vulnerability to shocks and decrease one's ability to withstand the aforementioned shocks, including, but not limited to economic, human, social, political, cultural, coercive and natural capital (Shaffer, 2008:200). While these variables affect the lives of individuals of all socio-economic characteristics, the resources to avoid and withstand shocks are scarcer in rural settings. Given the current movement towards a knowledge-based global economy (Warschauer 2004), increased ICT access and capability could lead to reduced risk and increased ability to access and accumulate necessary capital. For example, since its establishment in 1997, the International Institute for Communication and Development (IICD) has prioritised rural economic development through increased ICT access and use. Areas of focus include local entrepreneurship and youth employment, but the primary focus is on food security and agricultural economic development. According to the IICD (2012:2-4), farmers, workers and entrepreneurs can use ICT to:

- Access market information, including market prices, which, along with supportive training, can help them to make better, more informed decisions.
- Learn about, and share with others best agricultural practices through multimedia presentations.
- Build business skills and employment opportunities by developing basic ICT skills (including calculation, word processing, planning etc).

In all of the projects that the IICD reviews, we can see how farmers, workers and entrepreneurs are reducing their vulnerability to shock and increasing their capital in the form of knowledge and possibly increased revenue. In this way, we see how ICT is a means to increasing capital and how limited access to ICT can increase one's vulnerability.

Another useful lens is that of the Social Exclusion Approach, which identifies individuals lacking the "resources required to participate in activities and enjoy living standards which are customary or widely accepted in society" (Shaffer, 2008:197). Attempts to combat exclusion can be made by the state in the form of the provision of

social security or by measures that improve inclusion, including access to information. Burgess and Stern (1991 cited in Saith, 2001:7) define "the objective of social security as being "the prevention, by social means, of very low standards of living irrespective of whether these are the results of chronic deprivation or temporary adversity". One way that this can be achieved is through programs that aim to develop the individual's personal capabilities. Sen (2003: 43) explains that the capability approach directly relates the quality of one's life to one's ability to function within that life. This ability is determined by a set of capabilities. In a capabilities framework, Sen argues that quality of life can be judged by what people are able to achieve but that the capabilities to achieve differ amongst different people and societies (Clark, 2007:3). While Sen (Sen, 1985, 1993; Crooker, 1998 cited in Clark, 2007) does not offer a fixed list of ideal capabilities, he does argue that "the goodness of the capability set should be judged in terms of the quality as well as the quantity [and diversity] of available opportunities".

In his paper "Social Exclusion: Concept, application, and scrutiny" (2000), Amartya Sen traces the origins of the Social Exclusion Approach, ultimately grounding it in a context of poverty as capability deprivation (2000:3). Using this, Sen (2000:3) argues that the inability to participate in important activities including within a community, encompasses social exclusion and that the cause of this exclusion is the unavailability or inaccessibility of certain factors including specific capabilities. Verwey (2011) argues that "poverty can be thought of as the inability to establish a socially recognized form of entitlement to adequate goods and services". Sen (2000:05) later argues that "being excluded from social relations can lead to other deprivations as well, thereby limiting our living opportunities…[and as such] social exclusion can, thus, be *constitutively a part* of capability deprivation as well as *instrumentally a cause* of diverse capability failures". In this way, exclusion is both a deprivation in itself as well as the cause of a more severe deprivation. This is especially pertinent in the consideration of ICT in development, given that the world today is one that is information-driven and ICT are a means to access, store and disseminate information. ICT become the goods and services to which Verway has referred. The inability to participate in important activities due to the unavailability or inaccessibility of resources, including ICT, or knowledge how and confidence to utilise these resources

can lead to exclusion. This exclusion can lead to more severe deprivation. For example, if we had an individual who is unable to use a computer and the internet, but whose peers are able to use these resources, then that individual would potentially be socially excluded. Such exclusion could be articulated in the individual not being able to use the computer and the internet when his/her peers are or more indirectly, it could mean that that individual is unable to apply for an employment opportunity online and as such, misses an opportunity her/his peers don't. As Flor (2001:3) states: "We are now in the Informational Age, where knowledge is a critical resource and information is a primary commodity…ICT (specifically, the lack of it) may be considered both as a cause and an effect of poverty".

Drawing from the Vulnerability framework and the Social Inclusion and Social Exclusion[8] Approach frameworks, we understand that there are a number of factors that comprise human life – these include economic, human, social, political, cultural, coercive and natural capital (Shaffer, 2008:200)– and that these factors not only reduce vulnerability and increase resilience to shocks, but they also enable inclusion in socially prescribed activities and routine daily actions.

In his book *"Technology and Social Inclusion: Rethinking the Digital Divide*", Mark Warschauer (2004) proposes a framework that draws on social inclusion theories in relation to the digital divide. Warschauer argues that the basic notion of the digital divide as "the gap between those who do and do not have access to computers and the Internet" (2004:01) is oversimplified in that it implies that inaccessibility can be resolved simply through the provision of means (usually computers and internet access). Warschauer draws on numerous vignettes throughout the work to highlight that there are many resources required in ICT development, and that such resources can only be

[8] I understand social exclusion to be a capability deprivation that prevents an individual from fully participating in life. While Social Inclusion is defined as " the extent that individuals, families, and communities are able to fully participate in society and control their own destinies, taking into account a variety of factors related to economic resources, employment, health, education, housing, recreation, culture, and civic engagement" (Warschauer 2004:08). As such, Social Inclusion is the extent to which, and the reasons why, an individual is able to participate in society, while social exclusion is how and why an individual is prevented from participating.

determined according to an analysis and understanding of the context as well as a clear model for implementation.

Warschauer (2004:6) argues that too often, ICT projects do not recognise the complexity of access to information and technology, but rather frames people as belonging to the dichotomous categories of haves' or have nots'. This results in projects that "focus on providing hardware and software and pay insufficient attention to the human and social systems that also change for technology to make a difference…encompassing physical, digital, human, and social resources and relationships… Content and language, literacy and education, and community and institutional structures…"

2.2 What is the digital divide?

Castells (2000:7) writes that there has been a marked increase in social inequality both within, and between countries, during the 1980s and the 1990s. This inequality is articulated in unequal access to resources (such as money, food, health care and education) as well as political and social rights. According to the World Bank (1998, cited in Castells, 2000:8) "Education, information, science, and technology, become critical for [the] development of countries, firms, and people. These factors depend on societies' cultural/educational capacity, and thus become increasingly unevenly distributed". This uneven distribution of ICT is commonly referred to as the 'digital divide.'

According to Gunkel (2003:501) the origins of the term 'digital divide' remain uncertain and while references are often made to the US Department of Commerce's National Telecommunications and Information Administration's report 'Falling Through the Net: Defining the Digital Divide' (NTIA,1999 cited in Gunkel 2003:501), the NTIA has acknowledged that they did not originate the expression. The term, 'digital divide' is often presented as the simplified gap analysis between those who can and do access and use ICT ('haves') and those who can't and don't access ICT ('have nots') at household, country, or global levels. Kelles-Viitanen (2003) believes that while there has been some progress in reducing the digital divide, no one can deny that the digital divide exists between regions, between countries, within regions as well as within

countries. Kelles-Viitanen (2003:5) also indicates a link between the digital divide and the human development indicators[9] , illustrating a similarity in the patterns[10] of access to and use of ICT, and "more profound and longstanding economic and social division within and between societies".

Menzie Chinn and Robert Fairlie (2004) argue that while factors such as differentials in income, human capital[11], regulatory effectiveness, and telecommunications infrastructure (for examples see Dasgupta, et al. 2001, and Wallsten, 2003 cited in Chinn and Fairlie 2004) have been identified, definitive research to ascertain the determinants of the global digital divide is lacking. By drawing together a large body of research across a multitude of countries in a cross country analysis of computer and internet penetration, Chinn and Fairlie (2004: 2) are able to argue that "while income per capita is important in explaining the digital divide, so too are factors such as the communication infrastructure (as measured by telephone mainlines density), access to electricity, the institutional environment in the form of regulatory efficacy and the protection of property rights, and demographic characteristics" (including age). Chinn and Fairlie (2004) argue that disparities in human capital contribute to the global digital divide and that from their research, it is apparent that computers require substantial levels of education for use.

Given the perceived pivotal role of ICT in accessing and participating in what Warschauer (2002:6) refers to as the "informational stage of capitalism"[12], closing the gap has become a priority in ICT focused development. Kofi Annan (cited in Arunachalam, 2004:960) warned that as ICT developments evolve at an exponential rate

[9] The Human Development Index, which was developed by the United Nations Development Programs as an attempt to measure the multidimensionality of poverty, includes factors such as education as key in assessing poverty.

[10] Kelles-Viitanen argues that a digital divide exists within countries "between economically more and less-developed regions, between urban and rural areas, between poor and the well to do, between the educated and the illiterates, between men and women, and between the young and the old" (ITY 2002c cited in Kelles-Viitanen 2003).

[11] Human capital can be understood as "the skills, knowledge, ability to labour and good health and physical capability important for the successful pursuit of different livelihood strategies" (Scoones, 2005:8)

[12] According to Castells (2000:2): "Our economy is informational because the capacity to generate relevant knowledge, and process information efficiently, is the main source of productivity, and competiveness for firms, regions, and countries".

in some parts of the world[13], "the gap between information 'haves' and 'have nots' is widening, and there is a real danger that the world's poor will be excluded from the emerging knowledge-based global economy".

As the concept of the 'digital divide' gained popularity, rhetoric began to revolve around this concept of the gap between the information 'haves' and the information 'have nots'. According to Gunkel (2003), the digital divide offered an important first criticism to the initial presumption or "euphoric 'cyberhole'" that Information Technology (IT) would be accessible to all regardless of sociocultural determinants. By showcasing that this is not the case, the concept of the digital divide offers a warning that access to ICT "should not be assumed to be automatic or universally applicable" (Gunkel, 2003:2).

One of the primary criticisms of the digital divide rhetoric is that it relies too heavily on the physical presence of ICT, and as such, could be interpreted to mean that accessing ICT was simply a matter of having ICT to access which, in turn, is a matter of economic inequality. Barrantes (2005), like others, argues that while the economic foundation of the concept of the digital divide is fundamental, there are a number of other factors must also be considered. Warschauer (2002) offers three vignettes which highlight how the simple provision of physical resources without consideration of these 'other factors' can be detrimental to the success of the projects .

The first vignette refers to the "Hole in the Wall" model used in New Delhi, India which consisted of a publically accessible computer kiosk which encapsulated the computers. It was apparent that there were severe limitations in the project including that internet access was often unavailable, that educational programs were not specifically available, that there was no content in Hindi (the native language of the

[13] According to Chinn and Fairlie (2004:06) in 1990, there were only 2.5 personal computers per 100 people in the world. By 2001, this number had only increased to 9 personal computers per 100 people in the world and this growth was concentrated in a handful of countries with The United State of America, Sweden, Denmark, Switzerland, Australia, Singapore, Norway, The Republic of Korea, Canada and the Netherlands having the highest rates of computer penetration as per the 2001 statistics from the International Telecommunications Union. As a comparison, the computer penetration rate in The United States of America (62.50 computers per 100 people) has nearly 550 times larger than the computer penetration rate in Ethiopia (0.11 computers per 100 people)

youth engaging with the computers) and that the measures implemented to reduce evasiveness inhibited supervision, instruction and collaboration (Warschauer, 2002:2). The second story Warschauer (2002) shares, refers to a competition created by the Irish national communication company, Telecom Eirann (later renamed Eircom) to fund an "Information Age Town"[14]. When the project was reviewed after three years, it was apparent that in the winning town, Ennis, "advanced technology had been thrust into people's hands with little preparation. Training programs had been run, but they were not sufficiently accompanied by awareness programs as to why people should use the new technology in the first place. And in some instances, well-functioning social systems were disrupted in order to make way for the showcase technology" (Warschauer 2002:3). The three runner-up towns, however, were forced to plan more carefully how to use their significantly smaller financial resources, and were allowed more space for this planning because they were not under the same pressure as the winning town. The result was more a more integrated, thought out system. (Warschauer, 2002:3).

The final vignette offered by Warschauer (2002:3-4) tells of a computer laboratory in a college of education at an Egyptian university funded by the United States Agency for International Development (USAID) to establish a model teacher-training program in computer assisted learning. While logistics regarding functionality and maintenance of the computer laboratory were finalised, other departments in the college became envious of the resources being spent and faculty relations problems arose. The consequence was that the opening of the laboratory was delayed for a year – by which time, the equipment had lost a significant amount of its economic value.

Warschauer (2002) argues that technology projects often focus on the provision of hardware and software without giving sufficient consideration to the social systems into which these resources come. From these three anecdotes, we see that programs that are too focused on the supply of equipment and do not take into consideration the factors surrounding the access and use of ICT are often undone by the very elements that they overlook. He also argues that the digital divide implies a causality by

[14] Warschauer (2002:11) cites http://www.eircom.ie for more information about the competition.

suggesting that the lack of access to ICT impairs ones chances, when " those who are already marginalized will have fewer opportunities to access and use computers and the Internet" (2002:4). Through his argument, we see some of the flaws in the concept of the digital divide.

Barrantes (2005) offers an alternative concept of "digital poverty" which is not defined by economic wealth (or poverty). According to Barrantes (2005), those who are digitally poor (cannot or do not access ICT) can be those who lack both the ability to use ICT and cannot access ICT (supply and ability restriction), those who don't have ICT services available (supply restriction), those who are economically poor and have no demand for ICT (demand restriction) and finally those who are not economically poor but have no demand for ICT. She argues that this both allows for a more holistic understanding of how the situation arose with clear goals whereas "the gap concept, on the contrary, is elusive since relative differences will always exist, due to both cultural and income differences among countries coupled with technological improvements in telecommunication services" (2005:2). Barrantes (2005) believes that there are four factors that shape people living in digital poverty, namely, age, education, available infrastructure and accomplished functionality of the technology. Barrantes (2005) finds that the probability of reducing digital poverty is higher in households where the income is higher, employment is in the service sector and there are more income earners in the household. Digital poverty is also more likely in households with older compositions, less educated or illiterate members, or if there are more males than female household members. Households in urban areas, with electricity supplied by the national grid and telecentres in surrounding areas are less likely to be digitally poor.

2.3 Summary

Drawing on both the Vulnerability framework and the social inclusion and social exclusion frameworks, we see that resources (including capabilities) are essential as a means of participating in society but also of reducing, absorbing or repelling shocks. In the current movement towards a knowledge-based global economy (Warschauer, 2004), ICT is becoming increasingly important as the goods and services necessary for survival. This is because ICT, in its role as the means for storing, transmitting and

receiving information, is increasingly essential for reducing risk, and increasing the ability of people to access and accumulate necessary capital.

A multitude of factors determine the accessibility and utilisation of ICT including factors pertaining to supply, demand and capability (as outlined in Barrantes' concept of digital poverty). Regardless of whether one subscribes to the concept of the digital divide or prefers digital poverty or Warschauer's ICT and social inclusion framework, it is undeniable that there has been an uneven permeation of ICT both globally and within countries. Assuming that we subscribe to a rights-based approach that strives for equity, if not equality, in access of resources for all, and a 'fair' opportunity for all humans to survive, then addressing the uneven permeation of ICT is important. Not only do skills and knowledge in, and access to, ICT allow people to compete more fairly with one another, but ICT also has the potential to improve other aspects of human development such as health and livelihoods (including agriculture and entrepreneurship), to contribute to poverty alleviation and foster education and learning. (Chib, 2010 ; Flor, 2001 and Kelles-Viitanen, 2003) .

3. LITERATURE REVIEW: THE ROLE OF ICT

In the previous chapters, we have acknowledged that the uneven spread of ICT may have a detrimental effect on the well-being of those who cannot access and/or use ICT. Warschauer (2002) believes that there are many similarities between literacy and ICT access[15], and that the effects of literacy globally, as well as the continued detriment of illiteracy, are very evident and serve as an illustration for how people may be affected by the inaccessibility of ICT. Not being able to access information means that some will be disadvantaged when competing for resources. Castells (2000:3) also argues that "new information technologies allow simultaneously for the concentration of decision making, and for the decentralization of execution, thus solving the traditional contradiction between size and flexibility". Below I elaborate on some of the ways that ICT can contribute to poverty alleviation and development, later focusing on the role of ICT in education, including an overview of the spread of ICT in South Africa.

3.1 How can ICT contribute to poverty alleviation and development?

According to Kelles-Viitanen (2003:7), "poverty stems from situations where gross inequality in the ownership of assets persists because of vested interests and entrenched power structures". She argues that (2003:8) people stuck in a cycle of poverty not only lack assets (including productive resources and capital), but their employment is insecure, their living conditions are less than ideal and often unsanitary, they have poor health, lack education and social safety nets, they are exposed to discrimination, they have a lack of information and government action towards them is poor (including corruption and inappropriate policies and action). Kelles-Viitanen (2005:1) believes that "the role of ICT is catalytic in the complex task of poverty reduction by leveraging the effects on earning opportunities, on educational and health

[15] Warschauer (2002) argues that there are many similarities between literacy and ICT access including:
- that both are connected to advances in human communication and knowledge production,
- that both are necessary for participation in capitalism,
- that both necessitate a connection to a physical artefact (i.e. a book or computer),
- that both involve receiving and producing information,
- and finally, that both are tied to notions of divides (the *great literacy divide* and the *digital divide*).

services, on good governance and on promoting democracy"[16]. There is a large body of literature which argues that ICT will be of benefit to vulnerable people globally because it will increase their ability to compete for resources by creating new systems. This is especially the case as work activities living spaces changes and shift. Bryceson (2010) explains "smallholder farming populations are diversifying into non-agricultural work activities from which they increasingly earn their livelihood. Meanwhile in the [Africa] continent's expanding urban settlements, migration from the countryside and the contrasting size of the formal sector has channelled millions into new informal occupation pursuits." Examples of such new systems include open universities that share information electronically, or by improving existing systems, for example the electronic transfer of money in Kenya through the M-PESA system (Jack and Suri, 2010), which built on an existing system of bartering airtime. As such, we see that there are a number of areas in which the inclusion of ICT can be beneficial, including health services, good governance, promoting democracy, income generation/livelihood and education. The benefit of ICT can be in supporting existing structures or creating new alternatives, and much is dependent on the idea of knowledge management.

3.1.1 What is knowledge management?

"We are now in the Informational Age, where knowledge is a critical resource and information is a primary commodity", (Porat 1978 referenced in Flor 2001:3). The conceptualisation of the Informational Age is built on the idea of the "information society", which assumes a correlation between access to information and poverty under the premise that "information leads to resources; information leads to opportunities that generate resources; access to information leads to access to resources; and access to information leads to access to opportunities that generate resources" (Machlup and Porat referenced in Flor, 2001:3). Not only does a lack of information lead to poverty, but poverty also leads to a lack of information. According to Flor (2001) knowledge

[16] In an earlier paper, Kelles-Viitanen (2003:7) said that "economic growth is necessary but not sufficient when it comes to poverty reduction… If there is discrimination and social exclusion, how will the discriminated and excluded people take advantage of the expanded economic activities and share the benefits of the economic growth?"

management is the management of the intellectual assets of a system through a combination of organisational dynamics, knowledge engineering and technology.

3.1.2 What are some examples of where ICT is being utilised?

Arunchalam (2004) draws on the Information Village Research Project in India, as an example of knowledge management. The project is similar to that of telecentres in South Africa – a large centre that is connected to the internet and accommodates computers, radio systems, and telephones. The centres are open to all community members, including volunteers who are trained with computer skills. According to Arunchalam (2004:963), this allows them to manage social mobilisation on the one hand and technology management on the other, and bring these two together to reap maximum synergy. Information that is gathered by those in the centres covers a number of different topics including information about crops, farm practices, employment opportunities, health and government. One of the thought-provoking systems that the project had developed involved informing local fishermen of impending weather. Information that is received by centres is printed and placed on notice boards for fishermen to check before they leave for the day. It is also broadcast over a loudspeaker, a system that enables the wives of the fishermen to know the weather forecast (and therefore they can try to prevent their husbands from going out in bad weather). Such incorporation of existing systems (the noticeboard) with the new (the satellite information received by the centre, the system of broadcasting the information to the whole community) increases the sustainability of the system (Arunchalam, 2004).

ICT in extending communication and networks

Flor (2001) refers to the Grameen Phone Company and their attempts to revolutionise communication in India. Manuel Castells (2000) offers a report of the social implications of ICT, arguing that we are seeing the emergence of new forms of social and business organisation, which are based upon networks and tooled by communication technologies. He also argues that we are seeing the expansion and development of existing social networks which assist those who utilise ICT through electronic communication. According to Castells (2000:1), “Technology is a mediating factor in a complex matrix of interaction between social structures, social actors, and

their socially constructed tools, including technology. But because information and communication are at the core of human action, the transformation of the technological instruments of knowledge generation, information processing, and communication, has far reaching implications, which add specific social effects to the broader pattern of social causation".

ICT in building knowledge

Kelles-Viitanen (2005) believes that ICT can be used in a multitude of ways to access information, including through information kiosks or cellphones, and a number of topics, from rights to market prices, which such enquiries could be made about. Flor (2001) outlines an initiative in El Limon in the Ocoa region of the Dominican Republic, where community members had assistance in creating a hydroelectric system to generate electricity for houses and the local school. Once these needs were met, a computer was set up so that they could access the World Wide Web (WWW). Before the initiative, the community didn't have a library and so access to the internet created a valuable connection to information.

ICT in education

ICT is literally redefining the shape of education today. Open educational resources (OERs) are defined as " teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others" (Atkins, Brown and Hammond, 2007:4). In some instances, such as massive open online courses (MOOCs), these resources are structured in a formal manner, In other cases, there is more flexibility to how the resources can be utilised allowing learners free range. With the development on increasing advanced devices, it is increasingly possible to access these resources through mobile devices (including tablets and cellphones) which has lead to the rise in mobile learning (m-learning) (Traxler, 2005). Building on the previous example, ICT can be used in education to access information and also to create supportive links between schools. Flor (2001) also points out that ICT can be used to create systems of open learning and to facilitate distance education. Tinio (2002) believes that "for developing

countries ICTs have the potential for increasing access to and improving the relevance and quality of education. It thus represents a potentially equalising strategy for developing countries" (2002:6). She elaborates by discussing how ICT can be used in asynchronous learning (such as online courses that utilise videos) and how ICT can facilitate a single educational activity across multiple geographic areas (such as a webinar). ICT can also increase a learner's access to diverse material and it builds communication skills that are relevant in today's workplace. The diverse engaging nature of some ICT (such as online learning games) can encourage learners to learn and can help increase "active learning", "collaborative learning", "creative learning", "integrative learning" and "evaluative learning" (Tinio, 2002:9-10).

ICT in education and health programs

In relation to education and health programs, Kelles-Viitanen (2003) puts forward the example of the Committee to Democratize Information Technology (CDI) in Brazil's urban slums which, using recycled technology, volunteer assistance and some funding, has created 110 "sustainable and self-managed community-based "Computer Science and Citizenship Schools". These schools train more than 25,000 youth per year in ICT skills and provide social education on human rights, non-violence, environmental issues, health and sexuality (World Bank, 2001 cited in Kelles-Viitanen, 2003).

ICT in policy-making processes and governance

In policy-making processes, tools are available to better inform policy makers. An example of this is the creation of a poverty map which utilises geographic information systems (GIS) and survey and census data to create a map representing different information. Such tools are valuable for policy-makers (Flor 2001). Another example presented by Flor (2001) is of the local government in the Okinawa Charter in the Philippines which promotes online delivery of services. This includes "databases on local government assets and community resources that facilitate decision making among local government executives and policy making among members of local councils…[as well as] multimedia applications such as digital video [that] can be effective media for

citizens' education and process documentation of governance success stories" (Flor, 2001:12). Kelles-Viitanen gives the example of how ICT can help in the processing of information using the caste certification process in Andhra Pradesh, India. These certificates are essential for accessing scholarships and government service vacancies and the time for the process was drastically reduced from 20-30 days to ten minutes when an electronic system was introduced (World Bank, 2001, cited in Kelles-Viitanen, 2005:4). Kelles-Viitanen (2005) also believes that ICT can be used to hold government, private actors and development agencies to account through reporting mismanagement of resources or unmet promises. An example of this can be found in Honduras, when a group of small-scale fishermen sent congress a video of commercial farmers illegally destroying mangroves (UNDP 2001 in Kelles-Viitanen, 2005).

ICT in rural agricultural economic development

ICT can be used to monitor food security issues and warn about impending food scarcities. The IICD (2012) runs a number of small projects aimed at facilitating the use of ICT in agriculture for food security and agricultural economic development, as well as to support youth employment and local entrepreneurship. These projects include using ICT to gather recent weather forecasts or to check market prices for goods. An interesting finding resulting from these projects was that some of the market price information sources only include crops traditionally considered 'men's crops', meaning that women did not have the same access to vital information. The IICD have found that this connection to such information is very important. As they explain: "Being connected to the world strengthens the self-confidence and social inclusion of the staff of partner organisations and their members, which in turn helps to strengthen leadership…The importance of empowered, self-confident and entrepreneurial staff for creating development impact at the levels of farmers cannot be underestimated" (2012:4). Agüero, Barrantes and Waema (2014) argue that access to ICT helps to reduce transaction costs and facilitate market access. Specifically the delivery of services, including financial and educational services, through ICT reduces the amount of time previously spent travelling and waiting. The increased bargaining power that comes

from increased access to information also reduces price dispersion and creates an opportunity for more efficient management systems.

ICT in employment and income generation

With regards to income generation, Kelles-Viitanen (2003) says that while manufacturing ICT is unlikely to provide major employment, there are opportunities within the service sector. ICT can also help "to increase efficiency, competitiveness and market access for developing country firms" (2003:9). She also suggests that companies can market themselves online and that ICT "can help to increase access to market information or lower transaction costs of poor farmers and traders" (2003:10). In later writing, Kelles-Viitanen (2005) makes references to examples of some seemingly successful ICT-based employment opportunities. These include the rapidly growing Grameen Communication franchise (including Grameen Software and Grameen Star Education), online trading companies that allow local artists to bypass middlemen and sell their work, and a story in the Convergence Plus Journal (2003 cited in Kelles-Viitanen 2005) that tells of postmen taking cellphones with them when they do their routes and charging people in remote areas to use them.

ICT in Disaster Risk Reduction and Disaster Preparedness

ICT, especially cellphones, is an increasingly valuable asset in disaster risk reduction and disaster preparedness as tools in early warning systems, communication and response mechanisms and as the means for transmitting awareness raising messages (The World Bank, 2001 cited in Kelles-Viitanen, 2005).

ICT in poverty alleviation

Kelles-Viitanen (2005) believes that "since information exchange is part of nearly every element of the economy, the impact of improvements in the capacity for information exchange will depend critically on how the rest of the economy functions" (2005:1). As such, ICT interventions need to respond to the needs of the community, involve stakeholders and complement existing local level poverty reduction and development initiatives (Millar and Mansell, 1999 cited in Kelles-Viitanen, 2005:2).

Kelles-Viitanen (2005:2) says that "the goal of using ICT with marginalized groups, such as the poor, is not only about overcoming the digital divide, but rather enforcing and furthering the process of social inclusion, which is required for transformation of the environment and social system that reproduces poverty". According to the draft broadband policy for South Africa (USAASA:n.d.), some of the ways that ICT (specifically broadband) could be utilised in South Africa include for rural hospitals to purchase medical supplies and keep records (including prescriptions) online. USAASA also believe that such services could help foster eGovernment in South Africa and that the rural economy (especially farm and food sectors) will benefit from eBusiness. With regards to education, USAASA (n.d) state that "Broadband strengthens the life-long learning process and enables students to obtain real-time education from qualified teachers in areas where that instruction may not be available. Students can access alternative education resources and be exposed to new forms of educational content. It enables video-conferencing and facilitates inter-institutional collaboration". Subsequently, the processes and systems for generating income that those living in vulnerable conditions have access to, will be increased and improved.

3.2 What is the role of learning and education in the South African development process? Can ICT foster this? And if so, how?

According to UNISCO Dhaka (2001:8), The World Conference of Education for All (WCEFA) has called for the expansion of the concept of basic education to "education that fulfils the basic learning needs of all – children at first level, youth who are out of school and adults requiring lifelong basic education support – through a variety of delivery systems, formal primary schooling, non-formal/alternative schooling for those with limited or no access to formal schooling, literacy programs and informal education". They believe that this definition encompasses learning tools (such as numeracy and literacy) and basic learning content (such as knowledge and skills) "required by human beings to be able to survive, to develop their full capacities, to live and work with dignity, to participate fully in the development activities, to improve the quality of their lives, to make informed decisions and to continue learning".

Education in South Africa

2014 will mark twenty years since the first free, democratic election in South Africa. The past twenty years have seen remarkable national development successes. There continue, however, to be some major threats to growth and development including inequality, poverty, unemployment[17] and ineffective governance. At the root of these issues are the South African education and skills development systems.

In development, good education remains a proverbial golden goose because there isn't one model system that is perfect in all circumstances – what will work for one child won't work for another, and what is possible in one country may not be possible in another. In South Africa, the education system is tasked with simultaneously working to address the legacy of the Apartheid system, enduring the current context of poverty and inequality, all while developing the minds of the young South Africans who constitute the future of the country. As such, the expansion of formal education to include all South Africans needs to acknowledge the "peculiar history of this country's educational underdevelopment" while being "linked to the overall socioeconomic development of this society" (Fataar, 1997:331) and recognise that it is based in "a complex interplay of political, economic and social factors" (Fataar, 1997:339). Following the end of Apartheid, the formal education system had to rapidly expand to absorb a large number of children, with relatively inadequate resources. While we have seen a massive transformation in governance, management, curricular reform, and teacher professional development in South Africa (Isaacs, 2007), it is still insufficient to absorb the large numbers of children while providing them all with quality education.

Another concern is that the formal education system is supposed to produce skilled people who can then enter the workforce. Some (including Motala and Vally, Mail & Guardian, 29 January 2013) believe that there is a misalignment between education and employment in South Africa (partially due to poor analysis). Stumpf and

[17] Verwey (2011:122-124) argues that much of the unemployment rate in South Africa is rooted in the structural changes in the South African economy as well as the changes in the South African society. The fundamental result being that there is a large increase in the size of the South African labour force, which remains largely unskilled and uneducated, and only moderate growth in jobs which tend to be in secondary and tertiary sectors.

Niebuhr (2012) believe vocationally-orientated education in South Africa is viable and that it can create a learning environment that is responsive and able to better cope with the needs of South African society.

ICT in education

"The centrality of information processing and knowledge creation in all spheres of society assigns education a decisive role in tooling society, as well as individuals to be able to reap the benefits of new information technologies. But education itself is being deeply transformed by the information technology revolution" (Castells, 2000:4). Building on the idea that information is the essence of education, Castells puts forward an idea for the revolutionisation of formal education in schools. Drawing on the research of David Hargreaves (1998, cited in Castells 2000:5) he proposes that schools use ICT to strengthen networks and to increase flexibility and independence. An example of this could be intra-school and inter-school networks that allow for teachers to share skills and knowledge but also for students to pool more resources in learning. In line with this, Castells (2000:6) argues that "ICT-based pedagogy, and the inducement of the network school, are essential technologies of the Information Age, yet to be developed".

In 2007, Shafika Isaacs conducted a survey of ICT in Education in South Africa as part of a larger *info*Dev-supported *Survey of ICT and Education in Africa*. According to Isaacs (2007:4) the evidence of the legacy of Apartheid in the South African Education System is evident in the high rates of illiteracy, the shortages of qualified teachers and that "the majority of schools remain under-resourced, under-supplied, and over-crowded". Isaacs (2007) also notes that while South Africa has the potential for extended infrastructure, resources remain limited. Optimistically, Isaacs does acknowledge that South Africa does have a good legislative framework, into which ICT interventions could fit. In order to understand how ICT could foster learning and education in South Africa, we need to examine some of the current ICT interventions, the legislature in which they operate and what their strengths and failings are.

3.3 What has been the provision of ICT (especially in education) in South Africa to date?

ICT in South Africa

The 2011 Census indicated that only 8.6% of households access the internet at home while 16.3% access the internet on their phone. Together with the 4.7% who access the internet from work, and the 5.6% who access the internet from elsewhere, we see that the majority of households (64.8%) do not have internet access (StatsSA, 2012). Ngcobo and Herselman (2007) offer some explanation as to factors that have contributed to the hindered penetration of ICT in South Africa. Ngcobo and Herselman (2007:714) list illiteracy, cultural barriers, lack of computer skills and technological know-how, lack of access to computers and computer networks (as a result of the digital divide), no internet access and lack of significant usage opportunities as all being key barriers. Gillwald, Esselaar, Burton and Stavrou (2005) add that relatively high prices in the retail sector (including the cost of cellphones and fixed lines), minimal foreign investment in the sector, the high cost of internet and the limited number of public access points also contribute to the hindered penetration. For Jacobs and Ramoroka (2013) people who disseminate new scientific and technological information as well as the channels, through which this information is shared, are fundamental in enabling or blocking access to information.

Supporting the roll-out of ICT is, however, a priority at national government policy level and has been since 1994. In the 1994 'Reconstruction and Development Programme' (RDP), the African National Congress (ANC) stated that:

> The Telecommunication sector is an indispensable backbone for the development of all other socio-economic sectors. An effective telecommunications infrastructure, which includes universal access is essential to enable the delivery of basic services and the reconstruction and development of deprived areas (ANC 1994:2.8.3).
>
> The RDP aims to provide universal affordable access for all as rapidly as possible within a sustainable and viable telecommunications system; to develop a modern and integrated telecommunications and information technology system that is capable of enhancing, cheapening and facilitating education, health care, business information, public administration and rural development, and to develop a Southern African cooperative program for

> telecommunications. In terms of the RDP, telecommunications services must be provided to all schools and clinics within two years (ANC 1994:2.8.4)

Over the past twenty years, these ambitious aspirations have been extended and developed. Two key pieces of legislation, the White Paper on Telecommunications (1996) and the Act of Telecommunications (1996) were both vital for outlining the aspirations of the South African government at the time to facilitate the delivery of ICT to all South Africans. In 1996, South Africa hosted the Information Society and Development Conference. In 1998, Jay Naidoo, then Minister of Posts, Telecommunications and Broadcasting, described the motivation behind these aspirations when he said "…in the Global Information Society, there is a direct positive correlation between access to telecommunications and socioeconomic development. We realise that telecommunications is no longer the consequence of development; rather it is a necessary precondition" (cited in P.E.A.C.E foundation: 2010). The Electronic Communications Act (2005) defines "universal access" as being "where all persons in all areas and communities are able to obtain quality, affordable and usable access to a publically available minimum set of quality [services]".

There are three interlinked components to the government's delivery of ICT in South Africa. The first is the Universal Service Obligations (USOs) which made it mandatory for service providers to "extend networks and services to poor people in previously disadvantaged communities" (Braathen, 2010:1). Initially, the USO was applicable to Telkom, the national service provider, but later they were extended to all cellular operators. The second component is the Universal Service and Access Agency of South Africa (USAASA). USAASA was originally known as the Universal Service Agency (USA) and is responsible for managing the third component, the Universal Service and Access Fund (USAF – previously known as the Universal Service Fund). "This fund consisted of annual contributions from the operators in the market and was supposed to be used for the roll out of networks to previously disadvantaged areas and to subsidize services to needy persons" (Braathen, 2010:1). One of the primary ways that USAASA has tried to meet their obligations is through the roll-out of cyberlabs and telecentres throughout South Africa, including the four telecentres utilised during CLIQ.

Telecentres in South Africa

The definitions of telecentres vary between different analysts. Some define telecentres based on their technical purpose ie as a place of connectivity to a range of ICT. For others, these functions are grounded in a sense of greater purpose: "Telecentres are those entities which exist primarily to provide the general public access to computing and/or the internet with the explicit intent to serve a development purpose" (Toyama and Keniston 2008 cited in Coward, 2008). According to Dymond, Oestman, Whiting, Smithers, Milne and Milne (2010), telecentres can be commercial or not, and in some instances, they can exist as non-profits whose work is cross subsidised. In South Africa, the ambitious goal was that every community should have a telecentre by 2004 (USA discussion document cited in Attwood & Braathen, 2010). According to Benjamin (2001), during the period 1997 – 2000, 65 telecentres had been established across the country. At the outset, they were each equipped with 1-4 computers, telephone devices and internet devices. An evaluation of these telecentres in 2001, revealed that 32% were not operating or had been shut down and only 8% had access to the internet.

The evaluation (Benjamin, 2001) concluded that the primary reasons for the non-functionality of these telecentres included:

- Burglary/theft
- Technical problems (such as faulty phone lines or lack of electricity)
- Managerial weakness
- Financial problems (including that many telecentres were in debt).

Another key concern that Benjamin (2001) highlights is that only 32% of the telecentres paid their staff salaries. As such, staff who could find alternative, paid employment would leave their jobs resulting in a high turnover of staff. Benjamin (2001) concluded from his evaluation that the telecentre system as it had been rolled out was neither effective nor sustainable. The weaknesses in the roll-out plan were confirmed in an interview with the Head of ICT Policy Development in the Department of Communication (08.12.2008 cited in Attwood and Braathen, 2010:4) who said that the roll out of telecentres "was about technology dumping". In their review of different

forms of public access to ICT in South Africa, Gomez, Pather and Dosomo (2012) agree that little had changed in the problems in the telecentre model since first highlighted by Benjamin in 2001.

ICT in education in South Africa

According to Isaacs (2007:5-10), the current ICT in education policy framework has been evolving since 1996 and highlights the importance of ICT "in the promotion of economic growth, job creation, social development, and global competiveness" as well as promising an overhaul of education and skills development systems through the use of ICTs. According to Isaacs, the Information Society and Development (ISAD) conference which gave rise to the African Information Society Initiative (AISI) was an important turning point for the proliferation of ICT in South Africa. Isaacs (2007) describes key initiatives that followed, including:

- The establishment of the Presidential National Commission on the Information Society and Development, which advised "government on the optimal use of ICTs to address South Africa's development challenges and enhance the country's global economic competitiveness".[18]

- A Presidential International Advisory Council on Information Society and Development which "was established to advise government on addressing the digital divide with education as a key focus area".

- The launch of the Accelerated and Shared Growth Initiative for South Africa (ASGISA) in 2005 which saw "electronic communications as a cornerstone to commercial and social infrastructure development and education and skills development".

- In 1999, the State Information Technology Agency (SITA) was established to focus on the effective and efficient provision of ICT services with government.

[18] According to Braathen (2010:2) the Presidential National Commission on Information Society and Development (PNC on ISAD) was established "to enhance cooperation and coordination between the different actors and initiatives in the ICT area".

In relation to support of ICTs in education, Isaacs (2007:7-10) believes that two specific policies stand out. Namely the e-Education[19] White Paper and the e-rate policy (and its related establishment of an Educational Network (Edu Net)). The White Paper on E-education launched in 2004 by the Department of Education aims that "Every South African manager, teacher and learner in the general and further education and training bands will be ICT capable (that is, use ICTs confidently and creatively to help develop the skills and knowledge they need as lifelong learners to achieve personal goals and to be full participants in the global community) by 2013" (White Paper on E-education 2004:17). While the e-rate policy outlines regulations on costs and the creation of necessary structures, the e-Education White Paper offers an interesting insight into the ambitious aspirations of the South Africa government. This includes a holistic aspiration which would see students and teachers functioning across three dimensions, namely:

- "Operational – referring to skills to use ICTs
- Cultural – developing cultures that support the practices of using ICTs
- Critical – ability by teachers and learners to challenge assumptions embedded in the success stories about ICT" (Isaacs, 2007:8).

The draft ICT for Education Implementation Plan (2006 cited in Isaacs 2007) reports that of the 25,582 public schools in South Africa, more than half (13,011) have one or more computers for administrative purposes, and almost a quarter (5,778) have computers for teaching and learning. Access to the internet continues to be difficult for many schools which cannot afford unreduced rates or access reduced rates. Isaacs'

[19] "E-education is defined as much more than just developing computer literacy skills and the skills necessary to operate various types of ICTs. It is also the ability to:
- Apply ICTs, access, analyse, evaluate, integrate, present, and communicate information
- Create knowledge and information by adapting, applying, designing, inventing, and authoring information
- Function in a knowledge society by using appropriate technology and mastering communication and collaboration skills" (Isaacs, 2007:8).

extensive list of ICT initiatives and projects in schools[20] implies that there has been some relatively widespread diffusion of ICT. Although there seems to be a disappointing lack of co-ordination amongst those currently implementing ICT projects and initiatives, and "historically the lack of national co-ordination and facilitation functioned as a major constraining factor as various appendages of government, civil society, and the private sector operated in isolation from one another". (2007:25).

Isaacs argues that while the implementation of ICT to date has been uneven ("depending largely on the leadership, skills base and human resource capability available"), ICT access in schools is set to increase along with teachers' ability and infrastructure. She concludes (2007:25) by saying that " a national education system-wide, coordinated effort that encourages both the cognitive development of South Africa's youth and their employability and skills development through ICT-enabled lifelong learning, remains a critical challenge given South Africa's highly skewed youthful population". South Africa does have some examples of successful utilisation of ICT in education, including the University of South Africa (www.unisa.ac.za). While this system has its faults and legitimate criticisms have been made, there is no denying that online learning and qualifications have revolutionised South Africa by potentially taking education to South Africans rather than forcing them to come to places of education.

[20] Some of these include: the e-Schools' Network (www.esn.org.za), Gauteng online (www.gautengonline.com), The Khanya Project (www.khanya.co.za), The Meraka Institute (www.meraka.org.za), The New Partnership for Africa's Development (NEPAD) eSchools Initiative (www.nepad.org), The Shuttleworth Foundation (www.shuttleworthfoundation.org)

3.4 The findings of Community-based Learning, ICT and Quality of Life (CLIQ) project[21]

3.4.1 Where to access ICT: the (non) functionality of telecentres in South Africa

In this chapter, mention was made of an evaluation of telecentres conducted by Peter Benjamin in 2001. After the completion of the CLIQ project in 2010, it was apparent to the CLIQ team that many of the issues identified by Benjamin were still unresolved and that functionality of telecentres in South Africa seems rare. As Attwood and Braathen (2010:1) observe, "even those telecentres that were assumed to be well functioning, did not function properly". In their review of telecentres in resource-poor communities, "Telecentres and poor communities in South Africa: What have we learnt?" Attwood and Braathen (2010) identify a number of factors affecting the functionality of telecentres in South Africa. With regards to "supply factors" (See Barrantes 2005), Attwood and Braathen (2010) identify functional technology and equipment as essential, and technical and administrative skills amongst facilitators are also important. Benjamin (2001) also identifies recurring technical issues as one of the major reasons for telecentre non-functionality. Attwood and Braathen (2010) believe that facilitators need to be motivated and have the necessary technical and administrative skills. This is supported by the research of Lorentzen (1988) and Hudson (2001) who also see technical and administration skills as being important. Benjamin (2001) also notes that it is important that facilitators be paid. During the CLIQ project, some of the facilitators left for better paying jobs with greater job security. Attwood and Braathen (2010) believe it is essential that the community be involved in the initiation of

[21] In the period 2008-2010, 113 participants took part in the "Community-based Learning, ICT and Quality of Life" (CLIQ) project across four communities in KwaZulu-Natal - namely Adam's Mission, Inanda, eSicabazini and Nhlazuka. CLIQ was based on the belief that in order for people to successfully utilise ICT, they should receive training that they believe they need. It aimed to adopt a tailor-made approach by supporting the acquisition of, and measuring the impact of, skills necessary to operate computers and effectively utilise the internet to access information. As an action-based research project in KwaZulu-Natal, CLIQ was established with the overall goal of establishing whether, after a needs-based training, access to ICT can improve the well-being of people as defined by the people themselves.

the telecentre, that the telecentre has a vision and purpose (as either a business, a community service or a mix of both) and that the governance of the telecentre is such that local champions are attained and supported, including with the necessary political navigations. Finally, Attwood and Braathen (2010) believe that it is important that the roll-out of telecentres have state support in the form of long-term commitment and a partnership that translates into action. During the CLIQ project, they found that the provincial representative for USAASA was overstretched and that, because all requests must go through head office, responses were delayed unnecessarily.

Hudson (2010 cited in Attwood and Braathen, 2010:17) believes there are four considerations in analysing telecentres, these are:

- Community access (which includes affordability, location of the telecentre and the hours that it's open)

- Community awareness of the telecentre and its services

- Community skill to use, or access to assistance to use the telecentre

- Lack of barriers (which includes cultural barriers and a lack of job opportunities).

Drawing on these, Attwood and Braathen (2010) categorise demand issues as being matters of:

- Cost (including financial, time and opportunity): Many of the CLIQ participants rely on piece work for survival or were running their own business. In incidences where they arrived at the telecentre, sometimes having paid for costly transport to get there, only to find that it was closed, they became despondent. The cost of using a telecentre (R20 per hour in eSicabazini at the time of the research) is also relatively expensive.

- Skill and enthusiasm to use computers: In instances where facilitators were friendly and helpful and worked with the interest of the participants in mind, there appeared to be an increase in the demand for telecentres.

- Age and gender: The Social Views Diagram[22] highlights the beliefs of the community regarding who can and should use ICT, as perceived by the CLIQ participants. Younger people (men and women) are seen to be most likely to like using cellphones and computers, are seen to be able to learn how to use cellphones and computers more easily than others, are seen to spend more time and money on ICT and be more likely to benefit from the use of ICT. Older people (women and men) were seen to be slower to learn and less interested in ICT. The only common gendered statement was that older men are believed to think that women should not be using computers.

3.4.2 Why access ICT? What is the impact of ICT on quality of life?

According to Attwood, May and Diga (2011), it was critical to distinguish between impacts that would probably have happened regardless of CLIQ and those that were influenced by the CLIQ project. As such, impacts were classified as "a) direct impact (CLIQ impact linked to at least one of participant's reasons for quality-of-life change); b) indirect change (CLIQ impact was not linked by the participant to any reason for quality-of-life change but was linked to participant's definition of quality-of-life); and c) no or unclear CLIQ impact (where quality-of-life change was unrelated to CLIQ). Quality-of-life, as per the local definition, is defined by clothing, education, family structure and networks, housing, jobs or own businesses, personal characteristics (including beliefs, behaviours and attitudes), and money; as well as the ability to afford 'things' and the ability to do things for themselves (Attwood, May & Diga, 2011:13).

While it was very difficult to attribute causality in changes and in many cases, changes were the result of many factors. In some instances, small improvements were outweighed by big setbacks and vice versa. According to the CLIQ survey data, in eSicabazini, 73% of the participants felt that the quality of their lives had improved, while 24% felt that it was unchanged or had declined. 52% of the participants in eSicabazini felt that CLIQ had directly contributed to one of the reasons that this change

[22] This participatory tool is used to generate a mapping of perceptions of the participants by asking them to place statements under the relevant groupings. A further explanation is offered in chapter 5 of the dissertation.

had happened. 45% felt impacted on by CLIQ and although they did not associate the impact with any of their reasons for change in quality-of-life, the impacts did relate to their definition of quality-of-life. Finally, only 3% believed that CLIQ had had no/an unclear impact in their quality of life. The most common impacts include that participants in eSicabazini:

- Felt empowered or increased self-esteem, hope, direction, happiness and/or confidence;
- Had more friends, networks and social interaction;
- Attained computer skills;
- Had free use of computers; and,
- Acquired greater knowledge of the world or increased access to information.

3.5 Summary

I have argued that we exist in an informational stage of capitalism and that we recognise that ICT is essential for the storage, transmission and reception of this information. Access to, and use of ICT is therefore essential for those existing and competing in the modern world. The inaccessibility or the inability to use ICT, places one in the broad category of a 'have not' – someone who is unable to fully participate in society and who is more vulnerable to, and less able to recover from, the shocks of existence. One may not be able to access and use ICT for a number of reasons – from the technology not being available in your country to the technology costing too much to there being no electricity. It could also be a combination of any of these factors and countless others. Regardless of whether one can and/or does access and use ICT, it is undeniable that the world is rapidly changing and that ICT sits at the heart of this change. This is largely because ICT is used to store, transmit and receive information. As technology evolves it is possible to transmit more complex information further and faster than before. Owing to this core function, ICT can support a number of different sectors – including those that are directly linked to development and the alleviation of poverty.

A key sector in development and the alleviation of poverty both globally and in South Africa, is education. In this chapter, I have argued that we should understand education as being broader than simply the formal school system; rather we should see it as encompassing the informal, formal and non-formal ways in which humans learn. This broadened definition is key because it allows us to consider new alternative systems which could replace or support the strained existing education system. Access to and use of ICT is also beneficial because it allows learners and teachers to create or strengthen links with one another and share information and learnings – something that is key in the networked structures of modern society. Finally, ICT can be the catalyst for vital skills development. In such instances, it is not a matter of what one has learnt, but rather a question of what one can achieve with what one has learnt.

4. METHODOLOGY

The research questions were answered through the analysis of data collected through the CLIQ project as well as data collected in a separate fieldtrip. In this chapter, the design of the CLIQ project is outlined. I felt this as necessary here because both the fieldworker and I were associated with the CLIQ project and so our interpretations of the data were framed by the project. The participants interviewed were also part of the CLIQ project and so were influenced by their participation. I also used some of the data collected by the CLIQ team and re-analysed it to provide a clearer understanding of the attitudes and beliefs of the youth of eSicabazini. The objectives of my research were to explore the role of ICT in fostering learning and education. Attwood, May and Diga (2011) found that the acquisition of greater knowledge of the world or increased access to information was one of the most common impacts of CLIQ (Attwood, May and Diga, 2011), it was necessary that I conducted my own supplementary research to explore further how ICT could foster learning and education. As such, for the purpose of this dissertation, a case study of information gathered in one area, eSicabazini, is presented along with additional research conducted at the closure of the project with a sample of the participants. The methodology used and the reasoning for these choices is outlined in this chapter.

4.1 The CLIQ project design

The CLIQ project was based on a model in which two levels of computer training (basic and supplemented) were available. In two of the sites, the intervention was planned to take place immediately, and in the other two, in "the near future". The aim of this was to determine where the changes in quality of life were to do with CLIQ and where it was a matter of time passing. Training phases were straddled by assessments which monitored and guided the training design by offering insight into the lives of the community members and tracked changes in the quality of the lives of the participants. The process for data collection was designed to utilise an action research approach including participatory methods and tools for data collection (an example of one such tool is provided in Appendix 1). Such a design allowed for the training to be responsive and "needs-based" (CLIQ project Team, 2011:6) and was based on the idea

that participants are best able to reflect the context in which research was happening (Mayoux and Chambers, 2005). As per the project description (CLIQ project Team, 2011:1), the intervention was designed to follow seven stages, namely:

1) Information and questionnaire day: Completion of a baseline questionnaire[23] (including quantitative data) which was used in the selection process. This questionnaire was given to all people wanting to participate in the CLIQ project including the 162 selected participants across the four sites.

2) First assessment: An assessment of the life goals of the selected participants using participatory assessment methods and in-depth interviews, including a "self-assessment" of information needed to achieve stated life goals.

3) Phase 1 training: Basic training which included:

   - the use of personal computers,

   - an introduction to the basic suite of Windows' software,

   - internet access and searches,

   - and support in creating and maintaining email accounts.

4) Access to telecentres: Participants were also provided with a means to a system of access to computers through local telecentres at which they had a limited amount of "free usage" of 100 hours of internet access for a six month period.

5) Second assessment: A mid-term assessment, utilising mainly participatory group methods as well as in-depth interviews, which was used to track changes in quality of life.

6) Phase 2 training: A mid-term supplemental training which was derived from a revised assessment of information needs with common concerns including

[23] This questionnaire is different to the one completed in my independent fieldwork.

further studying, finding employment, starting up business ventures and social networking.

7) Final assessment: A final assessment, utilising mainly in-depth interviews, to track changes in quality of life and discuss attitudes towards goal setting.

More detail about the content of purpose of these assessments and trainings is outlined in Appendix 2. In eSicabazini, the dates for these stages were as follows:

- Information and questionnaire day (June 2008)
- First assessment (July 2008)
- Phase 1 training (November 2008)
- Access to telecentre to utilise 100 hours (November 2008 – April 2009)
- Second assessment (April 2009)
- Phase 2 training (November/December 2009)
- Final assessment (March 2010).

A rich, large body of data was gathered using the processes outlined above. It was evident that this project also became a mechanism through which to examine the socio-economic and, to a degree, the psychological contexts in which the participants lived. As the CLIQ team explained in 'CLIQ Community Report: A participatory approach to assessing the impact of ICT access on quality of life in KwaZulu-Natal', "Alongside this, participants discussed their quality of life and their life goals at different stages of their fieldwork" (2011:4). As such, interviews and discussions during the process revealed intimate details that highlighted some of the cultural practices, behavioural norms and common attitudes and beliefs amongst community members. For example, one community member commented that the interview was her favourite part of CLIQ because it made her feel "free".

4.2 Study context

The area of eSicabazini is located in the local municipality of KZ 271, which is known as Umhlabuyalingana and which falls within the larger district of Umkhanyakude. This district is located in the rural north eastern part of KwaZulu-Natal

province in South Africa and, according to a past Integrated Development Plan (IDP) for this area, incorporated "some of the poorest and most underdeveloped regions in KwaZulu-Natal" (Umkhanyakude District Municipality, 2002:11).

Similarly the Umkhanyakude area was affected by high levels of poverty and low levels of development including the lack of durable transport routes, a large orphan population, high levels of unemployment and low levels of education, uneven development, poor service delivery, the consistent presence of malaria and cholera, potential flooding in low lying areas, underutilised farming area, an incoherent marketing strategy for the district[24], and unequal access to work opportunities (Umkhanyakude District Municipality, 2002). Another issue highlighted was the exceptionally young age of many of the people living in Umkhanyakude. This created a number of possible concerns including that "the youthful population suggests a high dependency rate and also substantial pressure on the district to provide employment opportunities for school leavers" (Umkhanyakude District Municipality, 2002:21).

With regards to communication services, less than 1% of Umhlabuyalingana municipal households have access to fixed line telecommunication (Umkhanyakude District Municipality, 2010/2011:3). This offers interesting insight into the potential form of ICT development in the area. ICT that requires access to fixed line telecommunication will subsequently require massive infrastructural investment in the form of an increased number of fixed lines and possible points of infrastructure (in the form of telecentres). On the other hand, 70% of households have access to cellular telecommunication. As such, ICT development that utilised the use of smart phones would require less infrastructure, especially as smart phones become more widely available (ComputerWeekly.com, 2013).

[24] This is important as the area has a number of tourist attractions including the St. Lucia Wetland Park, The Pongola Dam, Sodwana Bay and a number of public and private game reserves which could bolster the economy of the area. Full utilisation of these tourist attractions is also hindered by "constraints on development due to poor infrastructure", "A perception that it is a low income, cheap holiday destination", Malaria, a perceived high crime rate, and a "lack of involvement and benefit from tourism by local communities" (Umkhanyakude District Municipality, 2002:18)

According to Singh (2008:79-80), the telecentre at which the CLIQ project was based in eSicabazini, was constructed in 2001 by the Department of Social Development from plans originally developed by the P.E.A.C.E Foundation[25]. "When the eSicabazini Community Centre was finally [re]launched on 26 November 2007, it housed a large community hall, pre-school, bakery, craft centre, computer centre and accommodation for 40 people… It has a central manager and individual entrepreneurs, or 'operators', who each run and profit independently from the other services which the Centre offers" (Singh, 2008:80). The telecentre was opened in 2008. At that time, it contained eleven computers which were originally run using Vuvuzela Communications[26], satellite connectivity, air-conditioning, furniture, office telephone, fax and a copier/scanner. The Vuvuzela system was replaced during the CLIQ project.

An analysis of CLIQ baseline information, titled "Descriptive report based on baseline survey of participants" (Bjarstad, 2010), was completed by a project member and circulated amongst research team members. According to Bjarstad (2010), of the 36 CLIQ participants in eSicabazini, thirteen (36.1%) were categorised as "unemployed youth". In eSicabazini, use of the telecentre facilities was R20/hour which excludes any transport costs getting to or from the telecentre[27]. 63.9% of the participants in eSicabazini walked to the telecentre (Attwood and Braathen, 2010).

4.3 Data Sources

[25] The P.E.A.C.E Foundation is a non-profit organisation that works to facilitate local development in the spheres of Planning, Education, Agriculture, Community and Environment. This is usually in the form of multifunctional P.E.A.C.E. Development Centres.

[26] According to the P.E.A.C.E Foundation (http://www.ngopulse.org/article/icts-provide-sustainable-development-rural-communities) Vuvuzela Communications "… has developed a software solution that enables beneficiaries to interact with information technologies in an extremely effective and user-friendly way… [through] the purchase and use of V-Time (Vuvuzela Time) [which is]… very similar to the way pre-paid cellular airtime works… [allowing] access to all the tools, ICT services and Vuvuzela software in the kiosk…Vuvuzela™ software is Icon driven for ease of use, and locks down the computer operating System (OS) so that the user has access to the comprehensive Vuvuzela suite only. The software content can be distributed and managed from remote locations, as well as offer Real-time reporting on kiosk usage with Full Audit Training".

[27] When asked about access to disposable income, 50.4% of CLIQ participants have access to R100.00 or less each month with 17.9% of the CLIQ participants having access to no money.

While the body of data gathered through the CLIQ project is rich, the focus of the broader research project was assessing the impact of ICT in accordance to the life goals of the participants. While some mentioned furthering their qualifications as part of their life goals, none spoke explicitly about 'simply' wanting to learn more, and yet learning was a constant part of the CLIQ process (whether it was learning a new skill or learning about something that was read online). As such, in order to highlight the issues of using ICT to foster education and learning, it was necessary to conduct additional fieldwork over and above the use, and reinterpretation, of the existing CLIQ data.

The additional data for this dissertation were gathered using a qualitative methodology design which was anchored in the CLIQ project. As such, the data that were analysed included qualitative data collected during the CLIQ project, as well as additional research gathered through fieldwork using a semi-structured interview. The qualitative data collected during the CLIQ project included the Social Views Diagrams which listed statements pertaining to the use of ICT. In this instance, age and sex were used as the two interesting factors in these quadrants. As such, the quadrants were marked "young women/girls", "young men/boys", "older women" or "older men". Participants were asked to place the statements in the quadrant which they felt it most applied to. In instances in which the statement applied to more than one quadrant, it was placed between the two or if the statement applied to all quadrants, it was placed in the middle. This exercise was completed with the participants during the second assessment stage of the CLIQ project. Project facilitators explained the process and guided participants as they each completed a diagram. For more information, please see Appendix 1 including a full list of statements.

The decision to utilise a semi-structured interview guide was made because it allowed for both structure and the gathering of necessary information as well as an opportunity for participants to share what they may consider important. Beyond demographic information, the semi-structured interview guide asked participants about their involvement in the CLIQ project (including questions about the stages of training that they completed, what part they enjoyed, what they learnt and how they learnt it), the

different skills they learnt and whether they have used those skills, as well as questions about the accessibility of the eSicabazini telecentre.

Participants from the eSicabazini site, who were classified as "Unemployed Youth" in the project, were invited to be part of my additional research. The fieldworker and I conducted the semi-structured interviews[28] with seven of the potential thirteen "Unemployed Youth[29]" of eSicabazini [30] using a interview guide. This group provided a specific snapshot of the people of eSicabazini, which is illustrative, rather than exhaustive. These semi-structured interviews were conducted in the language that the participant felt most comfortable speaking. Of the seven participants, only two felt comfortable conducting the interview in English and only one of these interviews was completed in English without some translation. All interviews were recorded and later transcribed and translated. Both the fieldworker[31] and I made notes during the interviews; this allowed for some cross referencing between the field notes and the transcriptions. In order to be classified as "youth", participants should have been 25 or younger at the time of the initial CLIQ interviews. However, one participant revealed to the fieldworker and I that he had in fact lied about his age to the CLIQ team in order to be accepted into the project because he wanted to learn how to use computers.

4.4 Sampling

Given the limiting scope of this Masters' dissertation, the decision was taken to focus on one research area and a sample of one type of participant in that area, namely 'unemployed youth' in eSicabazini. These participants were aged 18-25 at the time of

[28] Please see Appendix 3for the interview questions.
[29] During the course of the CLIQ Project it became apparent that the classification of "Unemployed Youth" may be problematic as participants' employment status would change over the course of the project– sometime quickly and sometimes only for a limited period. This is evident later in the dissertation when I refer to the income earned by some participants originally classified as "Unemployed Youth".
[30] There were thirteen participants who were classified as "Unemployed Youth" who participated in the CLIQ project in eSicabazini. I used the cellphone numbers provided by participants as well as the email addresses created during the CLIQ project to inform the participants about my research and that I would be coming to eSicabazini. When I was in eSicabazini, I tried to contact the participants through these means as well as word of mouth. I was not able to contact all of the participants, including two who were in Durban at the time seeking employment.
[31] The fieldworker had been part of the CLIQ project fieldwork and trained by Heidi Attwood. As such, she had a thorough understanding of the CLIQ project, an established relationship with the participants and the necessary skills to conduct the interviews.

their selection, lived in and around eSicabazini and were not employed at the time of the selection. The decision to focus on this type of participant was taken for a number of reasons. That these youth were unemployed indicates that they did not possess one or some of the capabilities necessary for securing employment or that they had the capabilities but there were no available employment opportunities. Understanding what these lacking capabilities may be, and potentially testing whether ICT could be linked with increasing capabilities through learning (and, hopefully, create employment opportunities) was one reason for the focus.

There is also a widespread belief amongst CLIQ participants that youth are more likely and better able to interact with and utilise ICT, something that the researcher wanted to better understand. Lastly, eSicabazini had been identified as the CLIQ project's model telecentre (Attwood, 2010) in terms of the research process "going according to plan". This meant that it was the most viable site for 'additional' research.

Given the decision to focus on the geographical area of eSicabazini, and within the group of unemployed youth, the sampling for this dissertation research utilised a census method given that I intended to interview the thirteen participants who were classified as 'unemployed youth' in the CLIQ project in eSicabazini. During the research field visit to eSicabazini, it was not possible to meet with all of the persons that had made up the 'unemployed youth' group. Reasons for this varied for different participants. In some instances, the participants did not access their emails and their cellphone numbers had changed, and as such it was difficult to contact them before the field visit to arrange interviews. When the research team arrived in eSicabazini, it also became apparent that some participants were no longer in eSicabazini. This limited the sample size to seven participants.

4.5 Analysis

I became involved with the CLIQ project in 2010 as a research assistant. During this time, it was possible to interact with the various academics and research staff and to read some initial findings from the CLIQ project. This experience was combined with a review of the available literature and some inductive reasoning. However, when I conducted the field visits and interacted with the participants, reviewed the available

literature more deeply and reflected on these experiences; it became apparent that while some inductive analysis was necessary, deductive analysis was the most relevant and as such was adopted for the thematic analysis and coding of the data. In the presentation of my findings, I sought to explore the role of ICT in fostering learning and education amongst youth in eSicabazini.

Drawing on the Social Views Diagram[32], I will present what the youth of eSicabazini perceive to be the attitudes and beliefs of their community before moving onto my own research which was conducted using a semi-structured interview guide. This will consist of a snapshot of the youth of eSicabazini – what parts of CLIQ they enjoyed, what they struggled with, why they wanted to be part of the process and what is stopping them from accessing ICT. As such, I explored what the perceptions of ICT were amongst the sample; why the participants became involved in the CLIQ project; what their perception of the project was; what, if any, skills and knowledge participation in the CLIQ project afforded the participants; what helped and what hindered the participants' access to and use of ICT; concluding with what could be done to make the use of ICT more conjunctive with education and learning. I use both thematic and descriptive analysis on both of these pieces which together form a snapshot of the experiences of youth in eSicabazini accessing and utilising ICT to foster learning.

4.6 Limitations

An important limitation became apparent over the process of data collection and analysis. This limitation is the bias of the researcher towards the concept of education as an end in itself, rather than a means to an end. The other limitations refer specifically to the logistics of data collection. As mentioned above, it was not possible to contact all of

[32]Social view diagrams offer participants a set of questions (in this instance, 24 questions) that relate to the subject matter. In this instance, the questions are about ability to use ICT and attitudes towards ICT use. Participants are then asked to arrange these statements within the diagram showing applicability of the statement for the different groups. This is based on their perception of the attitudes and beliefs of the group represented in each quadrant. Age and sex were used as the two intersecting factors and as such, the quadrants were marked: "Young women/Girls", "Young men/Boys", "Older women", "Older men". Statements could also be places between quadrants if the participant felt that the statement was applicable to more than one group. As such, the categories of "Young &older men", "Young&older women", "Young people", "Older people" and "All" also exist.
Please see Appendix 1 for further information.

the participants during the field visit and some participants had moved away from eSicabazini. As such, the semi-structured interviews were limited to the number of participants who were available at the time of the field visit, which totals seven unemployed youth. The number of interviewees was very limited and as such, is not a full representation of the population of eSicabazini. The group that I interviewed for the process did not comprise the "average eSicabazini youth". All had made it to their Matric year, with six of the seven passing their exams. Six of the interviewees also had a source of income, four of whom were not dependent on grants alone.

4.7 Ethical considerations

Having identified ethical issues in relation to my proposed research, a successful application was made for ethical clearance to the University of Kwa-Zulu Natal. When conducting my research, all efforts were made to abide by the ethical guidelines of postgraduate work including the inclusion of an informed consent form (Appendix 3) in the semi-strutured guide. As such, those interviewed did so voluntarily and were able to withdraw at any time. The records of the interviews and any resulting data have been kept confidential.

5. FINDINGS

The CLIQ project offered an opportunity to bring together researchers and community members to explore the idea of whether access to ICT could improve the quality of life of the participants. In order to do this, a wide spectrum of information was collected. This database allowed me to learn about the participants – especially those living in eSicabazini. As such, this chapter is divided into two parts. The first part presents an analysis of the data gathered during CLIQ which offers some insight into the beliefs of the eSicabazini community, as perceived by the youth of eSicabazini.

The second part will draw on the information collected during the semi-structured interview guide used during my independent fieldwork. This includes a description of the participants interviewed, their motivations for participating in CLIQ, some of their perceptions of the project and some of the barriers to accessing ICT that they have experienced. I close by considering how all of these factors affect the role of ICT in fostering education amongst youth in rural KwaZulu-Natal.

5.1 Social Views Diagrams: examining who should and can use ICT

In order to understand what can be done to make the access and use of ICT more conducive to learning and education, and what hinders the access and use of ICT, we need to examine the attitudes and beliefs of those utilising ICT. According to Ngcobo and Herselman, (2007) cultural barriers are one of the reasons for limited ICT use in South Africa.

When analysing the perceptions of the sample group, I utilised data that had been collected by the CLIQ project and reanalysed it looking for themes relating to the acquisition of the skills to utilise ICT and the use of ICT. The source of this data was the Social Views Diagrams. The diagrams I analysed were created by 'unemployed youth' in eSicabazini who participated in the CLIQ project. Diagrams of eight of the thirteen unemployed youth from eSicabazini were available for analysis. Of these eight diagrams, three belong to male participants and five to female participants. While these participants were not necessarily the same as those interviewed for this dissertation

(although there was some overlap), this exercise offered useful insight into the beliefs of the unemployed youth participating in the program.

When the statements are mapped out, it became evident that there is a divide based on age, with 'young men and young women' sharing a multitude of similarly placed statements, and 'older men and older women' sharing other statements. I've arranged the perceptions of the youth of eSicabazini in the table below. Columns 1 and 3 indicate the number of the statement used during the completion of the exercise during CLIQ project. Column 2 includes which statements the youth feel are applicable to young men, and column 4 includes which statements the youth feel are applicable to young women. This is not the same as the statements that participants felt were applicable to both young men and young women (written young people) which are presented in table 3.The number in brackets indicates how many of the eight youth feel that that statement is applicable to that group (for example, two of eight youth is written as 2/8). I've only included statements when at least two youth thought that the statement was applicable.

Table 2: Perceptions of the youth of eSicabazini

1.Statement number	2.Young men	3.Statement number	4.Young women
1	Access the internet through their cell phones (2/8)		
		2	Can learn to type very easily (2/8)
4	Can use the computer in order to get a job (2/8)	4	Can use the computer in order to get a job (3/8)
5	Can learn to use computers easily (2/8)	5	Can learn to use computers easily (2/8)
11	Like to play games on computers (2/8)	11	Like to play games on computers (2/8)
		16	Spend too much money on

			airtime for their cell phones (2/8)
17	Spend too much time on their cell phones (2/8)	17	Spend too much time on their cell phones (2/8)
23	Would find it useful to have an email address (3/8)		
24	Lives have improved because of using cell phones (2/8)		

Source: CLIQ Project data from Social Views Diagram reinterpreted by author

Between these two categories of 'young men' and 'young women', who share the common factor of youth, we see an overlap of statements number 4, 5, 11 and 17. Interestingly, statements 4,5,11 and 17 are also present in table 3 which refers to statements placed under the category young people. From this data, we can see that where there is some alignment amongst the youth about their use of ICT, it relates to the ability of youth to learn to use computers easily and that they can use these computers to either get jobs, or to play games. While the data does hint at a potential gender bias it is not possible to analyse this with such a small sample.

Within the categories of older men and older women, there is no overlap between what youth feel is applicable for older men and what youth feel is applicable for older women. Rather, two of the youth believe that older men "do not like their wives/girlfriends/husbands/boyfriends to use computers" (statement no.3) and that older men "do not need their own cell phones" (statement no.8). Three youth believe that older men "think that women should not learn to use computers" (statement no.20). When it comes to older women, two of the youth believe that older women "should not use computers due to their role in society (as mothers/women/young people/older people)" (statement no.15) and three youth believe that older women "don't know how to use cell phones properly" (statement no.9). Unlike the comparison between young men and young women, there is no overlap in statements repeated in relation to older men or older women. There was significantly more consensus regarding the application of statements along the age divide, that is applying to young people OR older men and older women. I've outlined these below in table 3.

Table 3: Perceptions of the youth of eSicabazini

Statement	Young men & young women	Older men & older women
1. Access the internet through their cell phones	2	0
2. Can learn to type very easily	2	0
3. Do not like their wives/ girlfriends/ husbands/ boyfriends to use computers	1	0
4. Can use the computer in order to get a job	3	1
5. Can learn to use computers easily	4	0
6. Do not like to send SMSs	0	6
7. Do not need to learn how to use computers	0	0
8. Do not need their own cell phones	0	1
9. Don't know how to use cell phones properly	0	3
10. Don't have time to use computers	0	5
11. Like to play games on computers	5	0
12. Like to use programs like Mxit and Twitter	5	0
13. Should learn how to use computers	2	1
14. Should not be on Facebook	0	4
15. Should not use computers due to their role in society (as mothers/ women/ young people/ older people)	0	3

16. Spend too much money on airtime for their cell phones	1	2
17. Spend too much time on their cell phones	3	1
18. Think that computers cannot help them in their lives	0	5
19. Think that they will not be able to learn to use computers properly	0	4
20. Think that women should not learn to use computers	1	1
21. Will find using the internet useful and interesting	6	0
22. Will not be able to learn how to use a computer	0	3
23. Would find it useful to have an email address	3	0
24. Lives have improved because of using cell phones.	3	0

Source: CLIQ Project data from Social Views Diagram reinterpreted by author

It is interesting to note that with the exception of four statements that overlap and one statement that apparently did not apply to either of these categories[33] (statement no. 7), the remaining nineteen statements either apply to the young people or to the older men and older women (written older people). As such, we can see that on the whole there is a differentiation between what the youth perceive of ICT use by youth and what the youth perceive about ICT use by older people. Some of the interesting findings to note include that half the participants believe that young people can learn to use computers easily and six of the participants feel that young people will find using the

[33] Given that participants needed to want to learn about computers to be part of CLIQ, and many of them expressed how they hoped computer skills would help them, it seems unlikely that they would say that anyone doesn't need to learn how to use computers.

internet useful and interesting, and three people believed that they can use the computer in order to get a job. Five of the eight participants also felt that young people like to play games on computers and that they like to use programs like Mxit and Twitter. Three participants felt that young people would find it useful to have an email address, spent too much time on their cell phones but also that their lives have improved because of using cell phones.

When looking at the perceptions of the participants on the use of ICT by older people, three of the eight believe that older people will not be able to learn how to use a computer and that they should not use the computer due to their role in society (as mothers/women/young people/ older people). Half the participants feel that this group should not be on Facebook. They also believe that this group don't know how to use cell phones properly (3/8), don't have time to use computers (5/8) and three quarters believe that this category do not like to send SMSs. Of the eight, four participants answered that older people would think that computers cannot help them in their lives, and five participants believe that they will not be able to learn to use computers properly.

The differences along these age differences are very apparent. The statements that participants chose as applicable to the use of ICT by older people are all discouraging, both in terms of older people's ability to use ICT, but also of their entitlement to do so. This is juxtaposed with the apparent belief that young people are able to, and will succeed by, accessing ICT.

5.2 What role does ICT play in fostering learning and education amongst youth in rural KwaZulu-Natal?

5.2.1 Who are the youth of eSicabazini?

The participants that were interviewed were seven of the thirteen people who fell within the initial category of 'unemployed youth'. All of these participants should have been 18-24 years old when they were selected for CLIQ, but as participant 5[34] revealed, he was actually 30 at the time of the interview and had lied about his age to be part of

[34] For anonymity purposes, the participants are ordered according to the order of their interview.

the CLIQ project. Four of the participants interviewed are men, the other three are women. All of the participants had written the Matric Examinations[35] during the period 2003-2007. Four of the participants had attended the same high school. With regards to employment at the time of my semi-structured interviews, two of the interviewees were employed in relatively regular jobs, two had temporary jobs and two depended on social welfare in the form of the Child Support Grant[36]. The seventh interviewee was unemployed and had "no source of income". The interviewees were asked to rank their households using a scale of "Very Poor", "Poor", "Just getting by", "Doing ok", and "Wealthy". None of the participants ranked their households as "Doing ok" or "Wealthy". Two participants said that their households were "Just getting by". Another two said that their households were "Poor". One of these participants qualified this by explaining that no one in the household is currently working. The remaining three participants said that their households were "Very Poor". One of these three participants explained that she made money by doing laundry for other people, because no one [in the community] is working, no one can afford to hire her. Another one of the participants that describes their household as "Very Poor" said that this was because they could not secure a permanent job. The third participant to select this description explained to us that his mother, the sole breadwinner in the household, had recently passed away leaving her four children[37] to fend for themselves. This information is represented in the table below.

Table 4: Demographics of participants

	Age	Sex	Source of income	Highest level of education completed	Place of education	Description of household income
Participant	23	Female	Washing	Matric	Nsalamanga	Very Poor

[35] These are the examinations completed at the end of high school in South Africa. It was a prerequisite for being part of the CLIQ project.
[36] All participants who were selected for the "Unemployed Youth" group were not employed at the time of their selection into the CLIQ Project. This, however, changed over the course of the Project.
[37] Two of whom were still enrolled in school and one of whom is married, and therefore tied to her new family

1			clothes for neighbours		(Ndlondlweni)	
Participant 2	23	Male	Child Grant	Matric	Dumangeze Secondary (eSicabazini)	Poor
Participant 3	24	Male	Construction	Matric	Dumangeze Secondary (eSicabazini)	Very Poor
Participant 4	22	Female	Unemployed with no income	Matric	Nodineka (Skhemelele)	Just getting by
Participant 5	30	Male	Unemployed with no income	Matric	Nodineka (Skhemelele)	Just getting by
Participant 6	26	Female	Employed at local lodge	Matric	Dumangeze Secondary (eSicabazini)	Just getting by
Participant 7	24	Male	Temporary work (thatching roofs)	Matric	Dumangeze Secondary (eSicabazini)	Very Poor

Source: Semi-structured interviews

5.2.2 Reasons for becoming involved with CLIQ?

For all of the participants in the case study, CLIQ was the first computer training course that they had attended[38]. It was also the first time that these participants had used the telecentre[39]. Some of the participants said that they had some knowledge about what a computer could be used for – typing, internet, downloading music, emails – but two participants said that they only knew computers by name. All of the interviewees wanted

[38] All of the participants interviewed attended the majority of the CLIQ training. Three participants each had to miss part of the training to attend to personal matters.
[39] Granted, the telecentre only opened in 2008 which is the same year that the CLIQ training commenced. Had there been more time between the centre opening, and the start of the CLIQ training, more participants may have used the facilities.

to use a computer before CLIQ; some believed it could be used to find a job. Six of the seven participants stated that money was the factor that stopped them from using a computer before the telecentre opened, four of them saying that money was necessary to study how to use a computer. All of the participants said that they had thought that participating in CLIQ would help them to secure employment. According to the interviewees, the reasoning for this included:

- Potential employers have indicated that they are looking for people with computer skills, especially those who have certificates to prove this qualification.
- One interviewee mentioned he/she wanted to be able to look for jobs on the internet.
- Two other interviewees mentioned they wanted to be able to make and use curriculum vitaes (CVs).
- One interviewee wanted to work with computers and has subsequently begun volunteering at the telecentre.

One interviewee explained that he had wanted to do a computer course after his sister was able to secure employment after doing a similar computer course. His sister works as a cashier at a local grocery shop – an occupation for which she does not need computer skills. This anecdotal story highlights the situation that these participants were in: all seven completed the final high school exams but none went on to study further. Securing a livelihood is paramount to survival. ICT offers means with which to secure a livelihood (through typing a CV, increasing marketable skills, looking for available positions or simply adding to one's qualifications). All of these participants saw ICT as a means to an end (in this case, the end is employment and subsequently, a stable livelihood).

5.2.3 Perceptions of the program

When asked what they liked using the telecentre for, most of the answers from participants referred to increasing connections with others (through Facebook and email) and accessing information (which was often related to seeking employment). Some

functions were highlighted as being particularly useful or enjoyable, such as Facebook, Microsoft PowerPoint, Skype and Gmail. When asked what they like about the internet, one participant replied that he likes to apply for jobs and institutions because he wants to get a better life. Another participant replied that it "makes the world smaller", with another participant sharing how she learnt how to use Mixit on her phone and now can communicate easily with many people. When the participants were asked what they liked using the computer for, one said that he likes applying for jobs and typing, another said that she enjoys emails, two participants said that they enjoyed using the internet, while another two said that they like to get information, with a third stating that he likes to know what is happening around the world, looking for jobs, chatting to friends and checking Facebook.

When participants were asked what their favourite part of the CLIQ process was, the answers were varied. For some developing a skill, such as accessing the internet over cell phones, searching for employment or connecting over email, was their favourite part. The answers of other participants allude to some of broader, contextual issues that are outlined in the discussion chapter. For example, one participant said that his favourite part was just to be able to touch the computer. Another said that practicing to use the computer was his favourite part because he never thought he'd learn how to use a computer given the poverty in eSicabazini and the lack of opportunities. One participant felt that her interview was her favourite part, because it made her feel "free" and she could talk openly.

5.2.4 Learning in the context of CLIQ

During the interviews, it became apparent that there was a lot of variation in computer competency and motivations amongst the participants of CLIQ. While there was a basic rubric of skills that were taught to the participants, different participants had achieved different levels of competency. A table of results showing these different skills can be found in Table 5 below. Reviewing these results, we see that using a scanner was the telecentre function that most participants felt unable to do (six of the seven participants responded that they didn't know how to do this). All seven participants felt that they are able to use a computer to send emails and to search for information. With

regards to the skills that had been utilised in the last month, using a computer to send emails was the most frequent (five of the seven participants had done this in the last month). Other common uses were using a copier machine to make copies, using a computer to type word documents, using a computer to search for information, using a computer to look for a job, and using a computer to register a CV.

Table 5: Coded results for Section C of interview - skills and usage of ICT and the eSicabazini telecentre

	In the last month have you used:	Do you know how to use:
i) fax machine to send a fax	XXNNNNN	YYNNNYN
ii) copier machine to make copies	OYYNNYY	NYYNNYY
iii) scanner to scan	OONNNNN	NYNNNNN
iv) printer to make prints	NOYNNYY	XYYNNYN
v) telephone to make calls	NONNNNN	YYYNNYY
vi) computer to type word documents	OYYNYYY	YYYNYYY
vii) computer to send emails	XOYYYYY	YYYYYYY
viii) computer to make a business plan	XXNNNNY	NNYNYYY
ix) computer to search for information	OXYYNYY	YYYYYYY
x) computer to apply for a bursary	NNNNNNN	NXYNNYN
xi) computer to apply to an institute	NXNNNYY	NYYNNYY
xii) computer to look for a job	XXYNYYY	YXYNYYY
xiii) computer to register your cv	XOYYYYN	YYYYNYN

Source: Semi-structured interviews

Participants had mixed reviews on what parts of the training were easy and which were hard. One participant said that “nothing was easy, everything was just normal and nothing was difficult because the trainer was always there”. Another participant shared how when using the computer for the first time, she was very nervous

because others had told her that it was difficult to use a computer and she had told herself she wouldn't be able to do it. Interviewees also listed different sources of instruction showing that participants learnt from each other as well as from the CLIQ instructor and the employees of the telecentre. Despite the training they received, it would appear that the interviewees were still not confident in their abilities to acquire skills by themselves. During the interview, we asked the participants "what they would still like to learn?" (Question 11A) and how they would be able to do so (Question 11B). Their answers to Question 11B below imply that the participants want "someone" to help them further their learning.

Table 6: Findings of question pertaining to possible future ICT support (following the question "What would you still like to learn how to do?")

	Question 11B	**How could you learn to do that?**
Responses	Interviewee 1	If she could find someone to pay for the course.
	Interviewee 2	If he could find someone to teach him.
	Interviewee 3	Wants help. He is not impressed with himself.
	Interviewee 4	Will go to the telecentre and ask [someone who works there] to help her.
	Interviewee 5	More training from CLIQ.
	Interviewee 6	Will go to the telecentre and ask those who know how to use it to teach her.
	Interviewee 7	Will pay for the internet. Needs someone to teach him. Knows someone who could teach him.

Source: Semi-structured interviews

All of the interviewees believe that they will not be able to acquire the skills to teach themselves and want assistance from another person. None of these participants mentioned the potential of searching for more information online and using one of the

multiple online guides. Later in the interview, we asked the interviewees if they had ever tried to find information about something "new" and if so what was it? Did they find information? And if so, how? The interviewees were also asked if they had found more information about something that they already had some knowledge of and if so, what was it, did they find more information and how did they find that information. Once again, the answers to these questions imply that some of the participants are still uncertain of their abilities to independently acquire new skills and information. While the question below (Table 7 and Table 8) asks participants to reflect on their past experiences, with some able to independently find information, the question above (Table 6) asked them to consider how they would prefer to develop new skills and increase knowledge in the future. When I analysed the responses to these questions (Table 6, 6 and 7), I found that even though some participants have had successful experiences finding information on their own in the past, all would still like some support in the future.

Table 7: Findings of questions pertaining to participant usage of ICT

	Question 1+2D	**Did you ever try to find information about something that you didn't know about? (Something new)** **If yes, what was it? Did you find information? If yes, how?**
	Interviewee 1	Yes, sending emails. Learnt from CLIQ.
	Interviewee 2	He missed the training for "how to apply" but "got it on his own" by asking Lucky ["who was in charge at the telecentre"] to train him. He had to pay R20.
	Interviewee 3	Yes, Facebook. Sifiso (part of the CLIQ team) helped him to set up his account. This participant has subsequently set up accounts for his schoolmates.
	Interviewee 6	Yes, skype. She got the address for the website from Sakhile and went to the telecentre to try it and "it worked".

	Interviewee 7	Yes, information about how to apply for the National Student Financial Scheme. Got the address from a pamphlet and found the necessary information on the website.

Source: Semi-structured interview

Table 8: Findings of questions pertaining to participants' usage of ICT

	Question 3+4D	**Did you ever try to find information about something that you knew about before? (Wanted to learn more?)** **If yes, what was it? Did you find information? If yes, how?**
	Interviewee 2	Yes, to attach files. Lucky trained him.
	Interviewee 3	Yes, Soccer/Football club the Orlando Pirates.
	Interviewee 5	Yes, reading the newspaper on the internet.
	Interviewee 6	Yes, saving information to my documents. She can now do this without assistance.
	Interviewee 7	Yes, Microsoft Excel. This participant wanted to know how to use a computer to complete calculations.

Source: Semi-structured interview

5.3 Perceived barriers to accessing and using ICT

Participants also felt that there were some factors constraining their use of the telecentre. While most participants recognised that the telecentre is a business in itself and so needs to generate money to cover its expenses, most felt that R20.00/hour was too expensive. Across the sample, equal numbers of participants felt that the telecentre should be free, R5/hour or R10/hour. Many participants also felt that the cost of transport to the telecentre was too expensive. While those living close to the telecentre (and therefore able to walk there) did not find the transport costs too much, three of the seven participants did. One participant shared that she has to pay R60 for transport to the telecentre. While many participants could not think of anything about computers or

internet that they disliked, some did have some interesting observations. One participant shared that they didn't like how computers hurt his eyes, another shared how he fears that his information could be taken from the computer and used for fraud and another participant shared how once one becomes accustomed to using a computer, you wish you had your own one. "Umgosi[40]" was also mentioned by two participants as one of the negative things that can result from computers and internet.

5.4 Summary and conclusion

Amongst the participants interviewed in this process, the adoption and utilisation of ICT skills and knowledge has been quite varied. Some participants seem better able to utilise their skills and for some, these skills are proving useful. Some participants shared how they have been able to use the internet to apply for jobs, or use computer programs to create invitations. One participant very enthusiastically shared how he can use many of the skills that he leaned in his current work. Two participants shared that they are now able to show others who know nothing about ICT.

As I prefaced this chapter, given the small sample interviewed during this research process, this study can only serve to be illustrative rather than exhaustive. When I was reviewing the social diagrams for eSicabazini, I was struck at how apparent the perceived differences between "old" and "young" were with regards to their ability to access ICT and the potential for ICT to impact their lives. ICT is often viewed as something that belongs to the youth, and this was apparent in the sample of social diagrams for the unemployed youth participants in eSicabazini. While all of the interviewees had at least heard of computers, with some knowing some of the potential uses and functions, none had received prior training. This was partially caused by a perceived lack of money to pay for the training, but also possibly a perception that "computers are not for us".

For most of the interviewees, computers were viewed as a means to an end. The end was often employment and subsequently, a source of a secure livelihood. As such, motivations included learning new skills, the ability and a space to look for available

[40] "Umgosi.net" was a chat website that provides a platform for anonymous gossiping.

jobs, a means to create a CV and a potential new avenue for employment (teaching computer skills to others). For most of the participants, access to and training in how to use a computer and the internet offered two key opportunities. These two opportunities were present amongst all of the participants regardless of their motivation or competency. The first opportunity was that of connection, both how participants were connected to other people through Facebook or email and how they were connected to potential job opportunities/scholarship applications and so on. The second opportunity was the increase in skills and knowledge, including skills such as typing a CV or finding information about a local soccer team. Interestingly, this second opportunity is both a means to an end and an end in itself. For example, being able to type a CV is a skill in itself but it also better enables you to apply for a job online. The findings reflected in Table 6 indicate that participants still lack confidence in their own abilities as many of them spoke of requiring assistance in taking their ICT skills further. Ideally such assistance should come from the staff of the telecentre but as Attwood and Braathen (2010) suggest, this is not always possible as staff are not necessary employed for their technological skills or those with such skills are sometimes not offered the necessary job security.

6: CONCLUSION

The aim of this dissertation was to explore the role of Information and Communication Technology (ICT) in fostering learning and education amongst youth in rural KwaZulu-Natal. In order to achieve this, relevant literature was reviewed in chapters two and three. From these chapters we see that technology is constantly evolving and increasingly, it is becoming pivotal in the functioning of society. Access to, and use of ICT, is not even globally. Some feel that the inability to access and/or use ICT is detrimental. In order to be able to counter this inability, however, we need to understand all of the cultural, educational, economic and socio-political factors that create it.

To better understand this potential, a small case study was utilised as a snapshot into the lives of seven youth living in a rural area in South Africa. All of these youths had taken part in the Community-based Learning ICT and Quality of Life (CLIQ) project which was designed to assess the impact of ICT on quality of life. This chapter will now review the main findings of the dissertation, explaining why they are important and where necessary, making suggestions for further research or any policy implications.

The role of ICT in contributing to poverty alleviation and development in South Africa through learning and education

An individual's place in the cycle of poverty is determined by that person's access to resources and power (Kelles-Viitanen, 2003). ICT is becoming increasingly important as the goods and services necessary for survival. This is because ICT in its role as the means for storing, transmitting and receiving information, is increasingly essential for reducing risk, and increasing the ability of people to access and accumulate necessary capital. ICT allows people to leverage "the effects of earning opportunities, on education and health services, on good governance and on promoting democracy" (Kelles-Viitanen, 2003:8). This enables people to compete more fairly with one another but also improves other aspects of human development including learning and education. One of the ways it does this is by supporting existing structures and/or creating new alternatives.

The South African government has identified access to ICT as being a key in addressing current socio-economic challenges and as such, has undertaken a roll-out of ICT infrastructure focusing on “disadvantaged areas”. The gap between the legislation and the implementation has, however, been very evident. Beyond the myriad of socio-economic factors that have affected the process, the ability of USAASA, the agency responsible for nurturing this roll-out, has been questioned. This is especially disappointing given the potential of ICT to alleviate the problems in the education system in South Africa by supporting existing systems of learning as well as offering alternatives.

There are a number of examples globally and in South Africa of ICT being used in constructive and innovative ways. There are also examples of ICT becoming available to those to whom it wasn’t available in the past, and some of the positive effects that this is having. Given the size of the telecommunication companies in South Africa, the USAF and the USO are a viable system for creating the necessary funds and infrastructure. As such, I would recommend that the service providers continue to contribute to the USAF and the USO. I would also recommend that the legislature regarding the roll-out of ICT shift to adopt a more realistic attitude with regards to deliverables and the potential for failure. I say this because legislature has set unrealistic deadlines for delivery which are then not met. In racing to meet the deadlines, the roll-out has become a matter of ‘getting it done’; leading to the technology dumping that was alluded to earlier in the dissertation. If South Africa rather starts small and invests in quality service (which includes reflection, and if necessary, flexibility) then the bigger roll-out will be easier. An example of this can be seen in the eSicabazini telecentre where the agreement to use the vuvuzela software was ultimately detrimental. Fundamental to this, is that USAASA and the Department of Communication recognise that the heterogeneous nature of South African society means that one size does not fit all.

What is the impact of training systems such as CLIQ?

In the interviews I conducted, it became apparent that for many of the participants, ICT was seen as a means to an end in that was a way to secure a livelihood which is

paramount to survival. From the research of the CLIQ team (Attwood, 2013; Attwood, Braathen, Diga and May, 2013; Attwood, May and Diga, 2011; Attwood and Braathen, 2010) , we see that being part of the CLIQ project, and in many instances, access to and use of ICT had an impact on the participants and their quality of life. This was according to the participants own identified impacts, the most common of which were:

- Felt empowered or increased self-esteem, hope, direction, happiness and/or confidence;
- More friends, networks and social interaction;
- Attained computer skills;
- Free use of computers; and,
- Acquired greater knowledge of the world or increased access to information.

While all of these impacts are important, three are of particular interest. The first impact that I would like to highlight is that participants felt that they attained computer skills, which indicates that the training is a success but also challenges some of the perceptions of the participants that computers are not for "people like me". The second is that participants felt empowered or experienced an increase in their self-esteem, hope, direction, happiness and/or confidence. This is important because it is a key attribute in fostering agency and making changes, especially in trying circumstances. When I interviewed some of the CLIQ participants for my own research, it was apparent that computers were a new thing for all of them but that they all thought that it would be possible to find a new/better job (one of the common life goals). The writings of Attwood (2013) and Attwood, May and Diga (2011) hint at some of the success stories of CLIQ participants achieving their goals or improving their quality of life, some of which includes finding a new/better job. The final impact, that is most pertinent to the topic of this dissertation, is that participants felt that they acquired knowledge of the world or increased access to information.

It became apparent during the interviews with the youth of eSicabazini that there was a lot of variation in computer competency and motivations for participating in

CLIQ. For all participants, access to and training in how to use a computer and the internet offered an opportunity to connect (to people and opportunities) and to increase skills and knowledge (which is both an end in itself and a means to other ends). All participants who were interviewed shared that they were able to send emails and search for information. The most regularly used skill (in the month preceding the interviews) was sending emails. Despite the confidence gained, the self-esteem grown and the knowledge acquired, it was evident in all of my interviews that continued support (in the form of money, support from a facilitator or even CLIQ) was desired by the participants.

The current South African model for the roll-out of ICT

Building on the concept of digital poverty explored by Barrantes (2005) I found that access to ICT is not simply a binary of haves and have-nots. From the research, I found that barriers that hinder the utilisation of ICT include illiteracy, cultural barriers, lack of computer skills and technological know-how, lack of access to computers and computer networks, no internet access, lack of significant usage opportunities, relatively high retail prices, minimum foreign investment in the sector, the high cost of internet and the limited number of public access points. From my own research, it became apparent that there are two key barriers that need to be overcome namely the social barriers and the logistical barriers.

The first in addressing the issues in the South African model for the roll-out of ICT needs to be addressing the social views of ICT in South Africa. The attitudes and beliefs expressed in the Social Views Diagrams and anecdotal comments like “I didn’t think computers were for people like us”, indicate that it may be necessary for USAASA to include some research in the socialisation of ICT in their scoping and roll-out. It was also apparent from the Social View Diagrams that it is necessary that ICT be better socialised especially if it is to overcome the apparent barriers (including cultural and social perceptions). The discouraging perceptions about some people’s ability to use ICT as well as their entitlement to do so, needs to be challenged using examples of peoples’ ability to, and success from, using ICT.

Many of the people interviewed during my research commented on some of the key logistical considerations for making the model of telecentres more successful. Three key issues which they highlighted included the cost of using the resources at the telecentre being too expensive (R20/hour) stating that it should be cheaper (R5 or R10/hour) or free. Another concern was the location of the telecentre. The ability to walk to the centre meant that it was significantly easier for them to access the resources than those who had to pay (one interviewee shared that she had to pay R60 for transport to the telecentre). The final key logistical consideration is the staff of the telecentre. When asked how participants learnt and how they envisioned learning in the future, all participants made reference to being assisted by someone. Benjamin's research (2001) indicates that many of the staff of telecentres do not have secure employment – something that leads to high turn-over and undermines the support system for those learning.

If the existing telecentres are to be sustainable, more resources need to be secured and available for the maintenance of the centres and the continued training of new staff (as the old ones move on to find better jobs).With regards to the telecentre model, I think that when we review the evaluation conducted by Benjamin (2001) and the experiences of the CLIQ team (2008-2010), we find that many of the issues are unresolved. As such, bar a handful of exceptions, I do not think that the roll-out of telecentres has been successful in South Africa. I would recommend that more long-term research into the system and possible solutions be conducted but also that USAASA consider funding alternative systems, the effectiveness of which can then be evaluated in comparison to the telecentre model. Flexibility in the model of provision should be considered as fundamental. I think that the model that Attwood, Braathen, Diga and May (2011) put forward, in which access to a telecentre is based on citizenship rights rather than whether an individual has the means to pay for access, is ideal. If we adopt this, then models such as the cross-subsidisation seen in one of the CLIQ sites, should be supported. Some of the other alternatives include the mixed cyberlab model outlined above but could also potentially include a mobile telecentre model.

It is apparent from my research and the outcomes of the CLIQ project that there are two different ways that telecentres are useful. The one is as a constant resource – for checking emails and job opportunities, connecting with others through social networks such as Facebook and "finding out information" or surfing the web. The other way that the telecentres are useful are as springboards for other things – for doing a training that then increases your qualifications or for typing and printing a CV. These "springboard" needs are not, however, constant and could be addressed in six monthly intervals by a mobile telecentre that comes to a community and runs free ICT skills development training. The training could be based on the model utilised by CLIQ with a basics component (for new users or people needing refreshers) and more nuanced support for more advanced people. Such a mobile system would also allow for the constant monitoring of ICT resources within their route and possibly provide some technical support (one of the issues identified is that those who are trained in technical skills leave more rural areas in search of better jobs and call outs to such places are very costly).

I would recommend that USAASA consider a roll-out of smart phones in communities that would be able to meet many of the "constant" ICT needs of information gathering and networking. I don't think that the phones should be free, but rather that the system should be subsidised.

Given the scope of this dissertation, it was not possible to review the cyberlab model utilised by USAASA in schools in South Africa. It is conceivable, that these cyberlabs experience many of the same issues that telecentres do in the provision of equipment. As such, it is recommended that more resources be allocated to provincial USAASA offices – both for staff who can assist the roll-out of hardware and software, and in terms of money to address small issues timeously. I would also recommend that some cyberlabs consider a multiple use model where resources are made available to the public (possibly at a small cost) when they are not being utilised by the learners and educators. This is not only a more efficient use of resources but, if the system included teaching support by educators and possibly older learners, it could develop the skills of the facilitators and the interests of the learners. For example, a grade 11 student who helps at the cyberlab after school when the public use the computers may realise that he

wants to teach computers when he finishes school. Such opportunities should also be supported financially by USAASA.

In closing

Glouberman and Zimmerman (2002 cited in Attwood, May & Diga, 2011) make the distinction between problems as being simple, complicated or complex with interventions into each type of problem requiring different levels of (increasing) inputs, and certainty in the outcomes of each decreasing as the complexity increases. As such, unless a problem is simple and one is able to control the factors contributing to it, it is unlikely that interventions will be simple. When considering what can be done to make the use of ICT in rural communities in KwaZulu-Natal more conjunctive with education and learning, we see that the issue is not simple but is rather both complicated and complex.

In its role as a means for storing, transmitting and receiving information, ICT seems integral in today's knowledge-based economy and given that technology is developing at the rate that it is, it is not inconceivable that people will be "left behind". This is especially a possibility when we consider the difference in access and use of ICT as determined by factors of supply, demand and capability. In education and learning, ICT offers opportunities to foster learning and education by supporting existing structures but also providing viable alternatives. Such support is needed in South Africa where poverty and inequality, which is articulated in many people unable to access a multitude of resources and finding themselves in a spiralling cycle of complex vulnerability. In order for ICT to foster education and learning, there are some changes needed to the current provision model in South Africa.

It was evident throughout the review of literature, the research of CLIQ and my own research, that people felt that accessing and using ICT could have a positive effect on their lives. This includes fostering education and learning. What was also evident throughout, was that ICT must not be dumped and that the support mechanisms for their roll-out are as important, if not more so, than the physical infrastructure. Having one USAASA representative per province is insufficient. Having all approvals and payments

go through head office is inefficient. Using a single model for roll-out of the services available in telecentres, instead of recognising and trying to cater for nuances, is ineffective. South Africans want ICT and fostering the access and use of ICT is essential to survival in today's knowledge-based economy. In order to do this, we need to review the needs and desires of all people, acknowledge the differences and complexities, build flexibility and reflection through research into our plan and start with small, effective interventions. In this way, we will be able to fully utilise the potential role of ICT in many avenues, including fostering education and learning.

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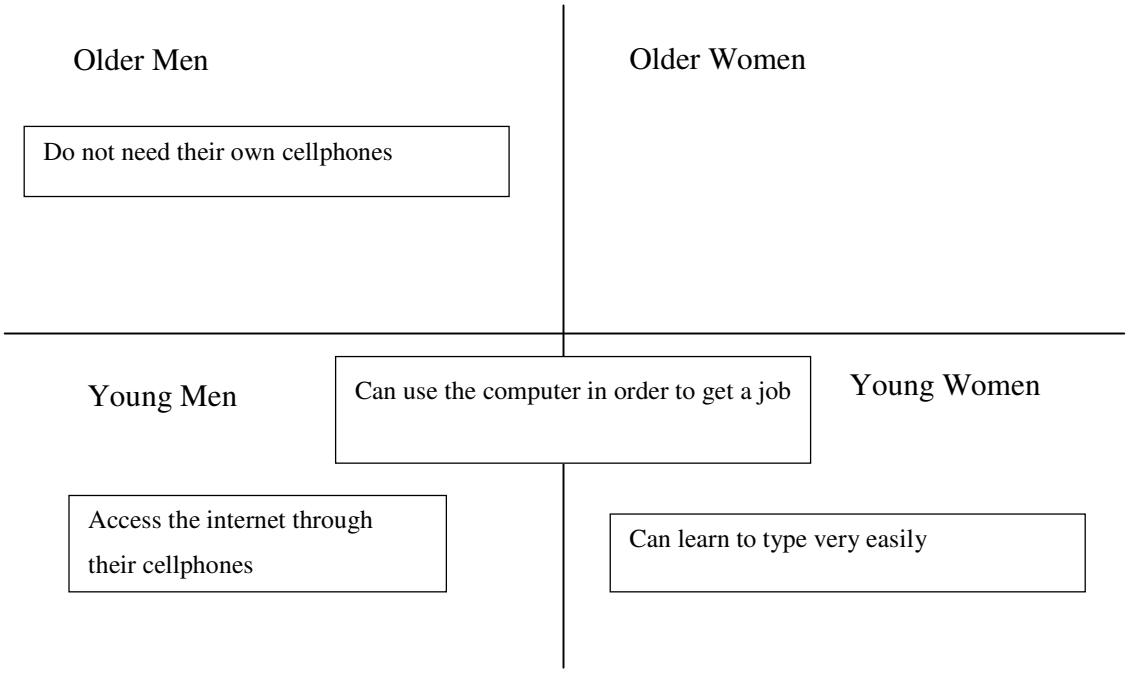
APPENDICES

Appendix 1: Social Views Diagram

The Social Views Diagram used the statements listed below (in Appendix 4) which participants were then asked to place within a four quadrant diagram. Age and sex were used as the two intersecting factors and as such the quadrants were marked "Young Women/Girls", "Young Men/Boys", "Older Women" or "Older Men". Participants were then asked to place the statement in the quadrant to which it most applies which simultaneously serves to highlight the participants' beliefs and the presumed beliefs of the different groups. Statements could straddle more than one quadrant and in the instances where they applied to all quadrants, they were placed in the middle of the diagram.

An example could look like this:



From this diagram, we can see that the participant who completed it believes that the older women of the community think that computers cannot help them in their lives and

that, according to this participant, both older men and boys think that women should not learn to use computers and so on.

Appendix 2: Full outline of CLIQ project process

Table 9: First Assessment (July 2008)

Time/ Day	Exercise	Purpose
Day 1	Time line (group exercise)	Mapping significant events in the community.
Day 1	Mapping (group exercise)	Creating a map of participants' perceptions of their community including distance and relation of key places.
Day 1	Time trend (group exercise)	Mapping changes in the community over time regarding development and ICT.
Day 1	"Picture yourself" (individual exercise)	A visual baseline for each participant
Day 2	Social Circle (group exercise)	A mapping of communication which asks participants "who" they communicate with, and "how" they do so.
Day 2	Communication matrix (group exercise)	A matrix of the perceived likes, dislikes, costs, convenience and common users of different types of communication
Day 2	Information matrix (group exercise)	A matrix of subject matter that participants have "needed more information on" including how they obtained that information
Day 3	Quality of life line (group exercise)	A mapping of participants' understanding of well-being or ill-being in their area including "well-being groups" and where they are located.

Day 3	Quality of life mobility (group exercise)	A mapping of changes in participants' well-being prior to CLIQ ie prior to July 2008
Day 3	Computer use diagram (group exercise)	A mapping of participants' knowledge about computers and computer applications as well as some information sharing about different uses.
Day 3	Goal setting (individual exercise)	An exercise to increase knowledge and understanding about participants' current 'occupation' including the difficulties experienced in that occupation, communication and information practices, realistic goal setting and planning for goals.

Source: CLIQ Project notes

From the exercises outlined above and over the course of the discussions in this three-day assessment, the CLIQ facilitators had an extensive and comprehensive mapping of the lives of community members. Key insights included information pertaining to the goals and aspirations of the community members (essential for measuring impact), the existing understanding and use of ICT (essential for planning and creating training plans) and the dynamics of the community.

Following this first assessment, the initial basic level computer training was then delivered to participants. This first training was a standard introductory level and was homogenous across the four CLIQ sites. This level was split between two modules, the content of which is outlined below.

Table 10: Basic level computer training (Phase 1, Modules 1 and 2) (November 2008)

Time/ Day	Exercise	Purpose

2 x 3 hour sessions	Phase 1 Module 1: Computer basics	To help participants use computers off-line (not connected to the internet) included: introducing participants to computers and operating systems; learning how to use the mouse; filing; saving and opening documents; and introducing participants to word processing basics (Microsoft Word).
2 x 3 hour sessions	Phase 1 Module 2: Internet and email	To help participants use computers online (connected to the internet) including: using the internet; how to find something on the web; learning the scope of information available; opening a Google Mail email account; sending and receiving attachments by email.

Source: CLIQ Project notes

Following this initial computer training, participants underwent a second assessment which not only allowed for a "follow-up" on matters discussed in the initial assessment, but also focused discussions more specifically on information and communication technology.

Table 11: Second Assessment (April 2009)

Time/ Day	Exercise	Purpose
Day 1	Update timeline	Update mapping of significant events in the area
Day 1	Reflecting on computer training (group exercise)	Gathering participants' comments and learnings from Phase 1 training and introducing participants to analysis through card sorting.
Day 1	Quality of life line review (group exercise)	Reviewing participants' quality of life line review and checking for changes, and reasons for changes
Day 2	Communication circle (individual exercise)	Mapping of who participants communicate with, how they communicate, and what they

		communicate about.
Day 2	Information Matrix (individual exercise)	An analysis of cost, usefulness and ease of obtaining information that participants needed in the previous 6-9 months.
Day 2	Computer use pie chart (individual exercise)	Creation of a pie chart mapping participants application use following Phase 1, highlighting the frequency of use and enjoyment.
Day 3	Revising goals and actions (individual exercise)	An individual discussion with fieldworkers including life changes since 2008, the revision of life goals, a reflection on the previous days' exercises and decisions about the Phase 2 training.

Source: CLIQ Project notes

The insight gained from the second assessment shaped the second phase of computer training. Some of the common requests centred around social networking (using tools such as Facebook), seeking employment (including topics such as how and where to look for jobs online; how to do a CV; how to apply online; what jobs are available), creating and/or maintaining small business (including topics such as local needs and supply; how to do a business plan and market your business; costing and business calculations) and further study (including topics such as what institutions exist; what they offer; how to apply online; how to look and apply for bursaries).

Table 12: Supplemental level computer training (Phase 2) (November/ December 2009)

Time/ Day	Exercise	Purpose
3 x 6 hour sessions	Phase 2: Need-based training	To help participants think about common life goals (e.g.: studying, finding a job, starting a small business) and to give specific computer

		training to use appropriate programs to improve their lives.

Source: CLIQ Project notes

As explained above, following this second (and final phase) of computer training, participants would be given vouchers equating to 100 hours of computer use at the telecentre at which they trained during CLIQ.

Table 13: Final Assessment (After Phase 2 training March-May 2010)

Time/ Day	Exercise	Purpose
Day 1	Mapping or life line review (individual exercise)	Update mapping of participant contact details and review data from previous assessments (including omissions for example, why a participant didn't attend a particular training)
Day 1	Impact of CLIQ (group exercise)	Evaluating the impact of CLIQ at community and group level
Day 1	Best and worst of CLIQ (group exercise)	Evaluating participants' personal experiences of participating in the CLIQ project
Day 2-5	In-depth semi-structured interview including construction of social view diagrams (individual exercise)	Discussing: - quality of life over the two years of the project (understanding changes in well-being, and reasons for those changes, over the duration of CLIQ), - any changes in that quality of life (understanding changes regarding happiness, money, social networks, computer and cell usage, hope, knowledge

		and activities, over the duration of CLIQ), - revisiting personal goals (assessing whether computer or cellphone use impacted on the ability of participants to reach their goals), - motivations and challenges to participating in CLIQ (discussing why participation varied throughout the project), - social views on computers (understanding local views on computer and cellphone use according to age and gender), and - ICT and computer knowledge (noting what participants learnt about computers over the duration of the project, where they learnt it and what the most useful skills and knowledge gained were).

Source: CLIQ Project notes

Appendix 3: Sample of the semi-structured interview guide I utilised in my research

Informed Consent Form

My name is Inger Harber (student number 205511303). I am doing research on a project entitled "Learning and Doing: Assessing the impact of ICT in fostering education and independent learning amongst youth in rural KwaZulu-Natal". This project is being supervised by Professor Julian May at the School of Development Studies, University of KwaZulu-Natal. I would like to ask you some questions about how you learnt about and use a computer and the internet. I am managing the project and should you have any questions my contact details are:

School of Development Studies, University of KwaZulu-Natal, Durban
Cell: 082 454 7429
Email: ingerharber@gmail.com

Thank you for agreeing to take part in the project. Before we start I would like to emphasise that:

- Your participation is entirely voluntary;
- You are free to refuse to answer any question;
- You are free to withdraw at any time.

The interview will be kept strictly confidential and will be available only to members of the research team. Excerpts from the interview may be made part of the final research report. Do you give consent for: (please tick one of the options below)

Your name, position and organisations, or	
Your position and organization, or	
Your organization, or	
None of the above	

to be used in the report?

Please sign this form to show that I have read the contents to you. ……. (signed) …….. (date) …… (print name) Write your address below if you wish to receive a copy of the research report: **Interview guide**
Section A: Demographic Information
A1. Date
A2. Time
A3. Name
A4. Age
A5. Sex
A6. Race
A7. Cell number
A8. Email address
A9. Source of income
A10. Highest level of education completed
A11. Year of completion
A12. Place of Education
A13. Would you describe your house as: 1) Very Poor 2) Poor 3) Just getting by 4) Doing ok 5) Wealthy
Section B: Involvement with CLIQ
B1. Did you participate in the CLIQ project?

B2. Which phase of CLIQ did you participate in? i) Initial interview ii) Phase 1 Module 1 iii) Phase 1 Module 2 iv) Phase 2 v) Final Assessment		
B3. Have you participated in any other training program?		
B4. Did you think participating in CLIQ would help you get a job? Why?		
B5. Did you think that participating in CLIQ would help you get a better job?		
B6. What was your favourite thing that you learnt during the CLIQ project?		
B7. Did you learn your favourite thing i) by yourself ii) with help from a friend iii) from the CLIQ instructor?		
B8. (Where possible) Would you please show me your favourite thing?		
B9. What did you battle to learn how to do?		
B10. What would you still like to learn how to do?		
B11. How could you learn to do that?		
Section C: Skills and usage of ICT and the eSicabazini telecentre		
C1. How many times in the last month did you use the telecentre?		
C2. In the last month have you used:		Do you know how to use:
i) fax machine to send a fax		
ii) copier machine to make copies		
iii) scanner to scan		
iv) printer to make prints		
v) telephone to make calls		
vi) computer to type word documents		
vii) computer to send emails		
viii) computer to make a business plan		

ix) computer to search for information		
x) computer to apply for a bursary		
xi) computer to apply to an institute		
xii) computer to look for a job		
xiii) computer to register your cv		
C3. When is the last time you used the telecentre?		
C5. When is the first time you used a computer?		
C6. Where is the place that you first used a computer?		
C7. Before the telecentre opened, what did you know about how computers work?		
C8. Before the telecentre opened, did you want to use a computer?		
C9. Before the telecentre opened, what stopped you from using a computer?		
C10. What do you think are the problems at the telecentre? [Possible prompts: Is transport too expensive? Is R20/hr too much? How much do you think you should pay? Do you think that the telecentres should be free? Why?]		
C11. Have you used the telecentre since the free hours ran out?		
C12. Did you pay?		
C13. What did you use the telecentre for?		
C14. What do you like using the computer for?		
C15. Why?		
C16.What programs do you like to use?		
C17. Why?		
C18. What do you like about the internet?		
C19. Why?		
C20. What do you dislike about using the computer?		
C21. Why?		
C22. What programs do you not like to use?		
C23. Why?		
C24. What do you not like about the internet?		
C25. Why?		

Section D: Additional research related questions
D1. Did you ever try to find information about something that you didn't know about? [Something new, Google?]
D2. If yes, what was it? Did you find information? If yes, how?
D3. Did you ever try to find information about something that you knew about before? [Wanted to learn more]
D4. If yes, what was it? Did you find information? If yes, how?
D6. What did you find the easiest part of the CLIQ course?
D7. What did you find the most difficult part of the CLIQ course?
D8. What have you used what you learnt for? [After the program, have you used what you learnt to do anything? What?]
D9. What can (could) you use what you learnt for? [Could it be useful?]
D9. Did the school you attended have computers?
D10. If yes what were they used for?
D16. Would the telecentre be better if it was somewhere else?
D17. Where?

Appendix 4: Social Views Diagrams - statements used in eSicabazini:

1. Access the internet through their cell phones
2. Can learn to type very easily
3. Do not like their wives/ girlfriends/ husbands/ boyfriends to use computers
4. Can use the computer in order to get a job
5. Can learn to use computers easily
6. Do not like to send SMSs
7. Do not need to learn how to use computers
8. Do not need their own cell phones
9. Don't know how to use cell phones properly
10. Don't have time to use computers
11. Like to play games on computers
12. Like to use programs like Mxit and Twitter
13. Should learn how to use computers

14. Should not be on Facebook
15. Should not use computers due to their role in society (as mothers/ women/ young people/ old people)
16. Spend too much money on airtime for their cell phones
17. Spend too much time on their cell phones
18. Think that computers cannot help them in their lives
19. Think that they will not be able ot learn to use computers properly
20. Think that women should not learn to use computers
21. Will find using the internet useful and interesting
22. Will not be able to learn how to use a computer
23. Would find it useful to have an email address
24. Lives have improved because of using cell phones.